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'Knowledge is proud that he has learned so much,
Wisdom is humble that he knows no more.'—COWPER.

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FRIEDRICH FRÖBEL,
THE GREAT REFORMER OF EDUCATION.

BY EMILY A. E. SHIRREFF,
President of the Fröbel Society.

WE have lately had in these pages a series of papers on Fröbel's method. We asked then, 'What has Fröbel Done for Us?' I propose now to ask, 'Who, and What was Fröbel?' In estimating a movement of any kind it is most important to know something of the movers, and what we want specially to learn is, what were their surroundings, what were the conditions of the time in which they lived, how were they influenced by them. For this reason, I think it will be profitable to give, as a sequel to the former papers, a short sketch of the life of the man whose genius stamped itself on the system we have been studying.

Fröbel's life presents many difficulties to the biographer, because it must be a record of thought, and inner development, and aspiration, more even than of action or outward change. He has himself given much of this record in two autobiographical letters, one to the Prince of Meiningen, written to unfold his views and in the hope of enlisting the powerful help of the Prince for his scheme of an educational institute; the other to Krause, a well-known philosophical writer, appealing against the hostile judgment of ignorant critics. These two letters have been translated and edited for the English reader by Madame Michaelis and Mr. Moore, under the title of 'Autobiography of Friedrich Fröbel,' and are of great interest and assistance to all students. Many fragments and letters of his have also been published, as likewise comments and recollections of great value by Baroness Von Mahrenholtz Bulow, one of his earliest helpers in Kindergarten work, and his most fervent apostle throughout her life. Some of them may be found translated in a small volume published some years ago*; and lastly, for readers of German, and who can consult longer works, Hauschman's 'Life of Fröbel' is most valuable; and Lange, in his edition of Fröbel's works, has probably collected all that can throw light upon his mind and his practical reforms. My object in these few pages can only be to indicate what are our sources of information, and to turn your attention to the struggles, inward and outward, of a fervent spirit bent on raising the education of mankind from bookish conventionalities to be, what to the religious mind it must ever be, the method whereby God's creatures can be best put in possession of the faculties with which He has endowed them, in order that, fulfilling the law of their nature, they may rise to a fuller spiritual life and help others in the same upward course.

Friedrich Fröbel was born in 1782, in a retired village of Thuringia, of which his father was pastor. The circumstances of the family were poor; his mother died when he was very young, and a stepmother, who ruled the household a little later, does not seem to have considered the comfort or the education of her husband's children as among her duties to provide for. Friedrich, as the youngest, suffered most, and perhaps this loneliness and neglect were partly the cause of his intense desire later that childhood should be made happy, and of his intense love of Nature and all the living creatures, among whom he had found some compensation for the loss of human companionship; while this condition of things helped him dimly to realise the sense of a link between all parts of God's creation, which became such a central point in much of his after teaching. When removed from his father's parsonage to the house of his mother's brother, who took compassion on the neglected child, these tastes and feelings had full scope for development; and when, as he grew up, the question of his future vocation had to be settled, he turned with aversion from a town life, and studied agriculture and forestry with a view to becoming a farmer and land agent.

Fröbel's education was most imperfect. Where there is jarring in the home life, education is jarred and broken; where a child is sent away to find among others, even those near and dear, what the natural home denies, education is marred, and thus Fröbel suffered a great loss, and he knew it. A naturally introspective habit, which led him through life to watch causes and effects in the formation of his own character and

* A 'Short Sketch of the Life of Fröbel,' by Miss Shirreff.

BRITISH MUSEUM

intellectual growth, was awakened in him at an age when most children take all their surroundings as simply as their daily food. Many of his mature views of education grew in later years out of the continual watching of his own deficiencies, his own unfitness for the vocation of education, in his eyes the most sacred that man could fulfil on earth. As regards, however, his own work in life this was not at first his aim. After his meagre school teaching in the public school of Stadt Ilm, where his uncle lived, and the few months at the University of Jena, which he purchased by the sacrifice of all the little share of family property that he ever expected to call his own, he first decided to become a land agent and surveyor; but after some time, finding this little to his taste, turned to architecture as a profession, and went to Frankfort to pursue the necessary studies. This move was an important turning point in his life; for there he was brought into relation with men who were to exercise no small influence over his future career. His motive in choosing Frankfort as his place of study was the presence there of an old friend on whose advice and sympathy he could rely, and by him he was introduced to Gruner, then principal of a new model school; and Gruner, who must have been a man of considerable insight, persuaded him to abandon architecture and to become a teacher, promising him, a young untried man, immediate employment if he would enter his school. He did so, and shortly realised that he had found his true vocation. Writing some time after to his brother he said: 'The impression made upon me by my first lesson to a class of thirty or forty boys ranging from nine to twelve, was as if I had found something I had never known, but always longed for and always missed; as if my life had at last discovered its native element. I felt as happy as the fish in the water, the bird in the air.'

Before settling down in Gruner's School, however, he had visited Pestalozzi, whose pupil Gruner had been, and the man won his love, and the work his deepest admiration. On this first occasion he went as a student; afterwards when he had charge of some private pupils he took them also to Iverdun, and taught there himself. In Pestalozzi he had met a kindred spirit, and though he was no servile copier he imbibed the spirit of the method. It was never mere teaching that he aimed at, earnestly as he loved knowledge; but true education, the formation of character, the realisation of the highest purpose of human life. 'I desire,' he said himself, 'to educate men whose feet shall stand on God's earth, rooted fast in Nature; while their head towers up to Heaven, and reads its secrets with steady gaze; whose heart shall embrace both earth and Heaven, shall enjoy the life of earth and nature, with all its wealth of forms, and at the same time shall recognise the purity and peace of Heaven'—earth the life of infinite activity and duties, Heaven the life of contemplation, the world of spiritual beauty and of thought.

The rigid routine of a public school like Gruner could not long content one who held such an ideal of education; nor when, having reluctantly accepted the private charge of three boys, with complete freedom to work with them as he thought best, could he be satisfied, for he then felt most distressingly the shortcomings of his own mental outfit for the post of teacher. He took them, as said above, to Pestalozzi, and studied himself while directing their studies. But this could not last, and when an unexpected legacy gave him the means of following what he considered to be best for his future career, he resigned the care of the boys, and went to the University of Göttingen, and subsequently to Berlin, to enter upon serious study of languages and science. He was at Berlin when the fierce rousing of patriotic feeling against Napoleon led to the grand uprising of the nation in 1813; and Fröbel, though not a Prussian, and therefore not bound to serve, entered Count Lutzow's famous corps of volunteers, urged to do so less by patriotism, since Prussia was not his Fatherland, than by the feeling that one who meant to be an educator was morally bound to give the young the example of self-sacrifice for a great cause.

'It was hardly possible for me,' he writes, 'to conceive how any young man capable of bearing arms could think of becoming an educator of children whose country he would not defend with his blood or his life. It was impossible for me to imagine how a young man who should not be ashamed then to hang back like a coward, could later, without shame, and without incurring the scorn and derision of his pupils, stir them to any great thing, to any action requiring effort or self-sacrifice. This was the second consideration that weighed in my decision. Thirdly, the call to arms seemed a token of universal need of the men, of the country, and the times in which I lived, and I felt that it was unworthy and unmanly not to struggle for such an universal necessity, not to bear one's own share of peril in the thrusting back of a general danger. Before all these considerations then, every opposing view gave way, even that which belonged to the fact of the unfitness of my weak constitution for the trials of such a life.'

In our peaceful days, such a view may seem to some overstrained; but his noble words are full of interest, showing how strongly he was influenced by the sense of the responsibilities of the Educator's office, and also throwing curious light on the Separatist feeling between different parts of Germany before the present Empire was founded. Thus Fröbel made a sacrifice, and a great one, by interrupting his cherished studies and delaying his entry upon practical life; but the very first night spent in the wild bivouac endowed him with a treasure no studies could have brought him. That night he was introduced to two young men, Middendorff and Langethal, students and volunteers like himself, and they became the close friends of all his after years.

The Prussian Government in recognition of the volunteer service of one who was not a Prussian subject offered to Fröbel an appointment in the Natural History Museum at Berlin, which he gladly accepted, and when the peace of 1814 released him from military duty he proceeded to take up his new office. At this time he would have been glad permanently to embrace University life, hoping to forward his views of Educational reform through his influence over the young students; but this hope was fallacious, as one more versed in practical life might have foreseen. He found students with character and aims formed under false methods of education, without that true desire for self-culture in the highest sense that would have made them his disciples; and still unshaken in his conviction, and pondering deeply the problems of man's spiritual life, he began to realise more and more that it must again be as a teacher of the young that he must strive to work out his ideal, the very meaning of which it was so hard to make men understand. It rested, indeed,

on what was not likely to be accepted easily, on his firm conviction 'that the whole former educational system—even that which had received improvement—ought to be exactly reversed, and regarded from a diametrically opposite point of view—namely, that of a system of development. I answered,' he continues, 'those who kept asking what I really did want after all, with this sentence, "I want the exact opposite of what now serves as educational method and as teaching system in general." I was and am completely convinced that after this fashion alone genuine knowledge and absolute truth—by right, the universal possessions of mankind—shall find not alone single students but the vast majority of all our true-hearted young men and of our professors, spreading far and wide the elements of a nobly-humanised life.* To bring this into a practical scheme, I held to be my highest duty—a duty which I could never evade, and one which I could never shake off, since a man cannot shake off his own nature. And the opportunity came at last.'

Two years after his position at Berlin had seemed secured, circumstances occurred that made him feel it to be his duty to give it up, and which finally opened the way to the career which he had so long felt to be his true vocation. Then circumstances arose in his own family, when his eldest brother, who had always been his best friend and confidant, died, leaving two boys, and the widowed mother thankfully accepted Friedrich Fröbel's offer to take them under his charge. Another brother shortly after confided three boys to his care, and he moved first to Griesham, where his sister-in-law still had a house in her husband's former parish, and afterwards to Keilhau as offering greater advantages for a school. Other pupils soon were added, and here he was joined by Middendorff and Langethal, and shortly after by Barop. A great human interest united again the little knot of friends who had been so strangely bound together round the watch-fires of Lutzow's wild volunteer corps. In the younger men friendship was mingled with a reverence which made them ever ready to follow where Fröbel led. It became that high and noble thing—loyalty, which even its lowest phases excites the admiration due to generous devotion, but which, given to the leader who impersonates a lofty idea of action, stands foremost among the noblest things on earth. The whole power of a man's nature then goes out in love and service to one in whom he recognises his guide to whatever is highest and best in human life. Trial and difficulty do but make the devotion more ardent; and in hours of failure, perhaps of such weakness or error as are inseparable from all human enterprise, it seems reasonable even to abdicate for a time the independent exercise of reason, and still to follow without faltering the leader's banner. All the moral and intellectual worth of these men was thus given to the service of the friend they revered as well as loved; and the affection born amid the free intercourse of an adventurous life, amid youthful excitement and daily peril, had but grown stronger and more tender when, after nearly forty years of struggle and labour, and often weary disappointment, Middendorff pronounced his touching oration over Fröbel's grave, and turned from it to continue his work.

* This sentence stands so worded in Fröbel's letter to Krause, as translated in the autobiography. He unfortunately never became a good writer or speaker

WELL-KNOWN TEACHERS AT WORK.

VII.—DR. GEORGE BEACH, M.A.

Head Master of Christ Church (Higher Grade) Boys' School, Macclesfield.

THERE are few teachers better known to their professional brethren than Dr. Beach. By means of his 'Entertaining Readers' for Scholars, his Serial Articles for Pupil Teachers, his Manuals for Students in Training and University Candidates, his name has become familiar throughout the whole circle of the teaching profession.

Dr. Beach was born at Oldbury, near Birmingham, in the year 1852, his father, Mr. John Beach, being a most prominent and influential inhabitant, from whom the subject of this sketch inherited his qualities of indefatigable industry, indomitable fearlessness, hatred of injustice, and love of independence. Up to twelve years of age, he attended Messrs. Chance's Schools, Oldbury (Head Master, Mr. Shaw Hanson), and the Wesleyan Schools, Oldbury (Head Master, the late Mr. W. Kay). He next, from 1866—1870, served his apprenticeship at the Wesleyan Schools, West Bromwich, whence he proceeded with a First Class Scholarship to Caermarthen Training College, which he left after two years' training, with a First Division, the usual Drawing and Science Certificates, and the Queen's Euclid Prize.

He now assumed, at the early age of twenty, the Head Mastership of the Russell Street Board School, Wednesbury. This school had been opened for ten months, with a resulting average of 12!, but Dr. Beach's energy and skill increased the number in eighteen months to 150. Here he obtained his Parchment Certificate, endorsed by W. P. Turnbull, Esq., H.M.I., with the following sarcastic entry:

'*G. Beach appears to be desirous of imparting knowledge.*'

This entry, compared with previous and subsequent successes of so marked a character, is a signal illustration of *the injustice of estimating a year's work upon an isolated day's results.*

Leaving Wednesbury at Christmas, 1873, Dr. Beach obtained, through the influence of the **Right Hon. Joseph Chamberlain**, the post of Reserve Master under the Birmingham School Board. After only nine months' service, ill-health compelled a change to a country school at Cheadle, Staffs., in succession to his brother, W. P. Beach, Esq., H.M.I.A.

In discharging the duties of this post nearly seven years were spent, and the thorough education given to the children, and the social status claimed, gave, at last, dire offence to the rural magnates. On one occasion an influential specimen of the fossilised Tory gave vent to the following cursory remark:

'—— *you, Mr. Beach, we shall have no ploughboys left.*'

At this time for the whole Cheadle Union, containing

70 square miles, there was *one* Attendance Officer whose stipend reached the enormous sum of £20 per annum. By Dr. Beach's efforts this was raised eventually to £70; but no quarter was hereafter shewn to him.

An honourable exception was the rector, the late Rev. R. Watt, M.A., who manfully championed Dr. Beach throughout a lengthened and bitter persecution, and finally was mainly instrumental in procuring from the managers, upon leaving, a vote of £10, as an expression of implicit confidence and sympathetic esteem.

Persecution either mars or makes. It *made* Dr. Beach. Immediately he commenced Academical studies, placing the goal of LL.D. before his eyes, and for seven years of severest mental toil and strain laboured on with distinguished success until the prize was grasped. These extraneous efforts, as the high results of the schools demonstrate, were in no wise allowed to occupy school hours, or interfere with ordinary duties. They were achieved by '*Toiling upward through the night.*' Before leaving Cheadle (March, 1882), Dr. Beach matriculated at Trinity College, Dublin. The Head Mastership of Christ Church (Higher Grade) Boys' School, Macclesfield, was the next post occupied (June, 1882), and is at present retained.

Here uninterrupted success, both at school and his Alma-mater, attended him, the B.A. degree (2nd in first class) being taken in 1885, the LL.B. 1886, and the LL.D. (1st on list) in 1888. The M.A. degree was also proceeded to coincidently with the last.

Dr. Beach married, in 1874, Miss Hartwell (Westminster, 1871; Southlands, 1872) to whom he is greatly indebted for assistance rendered in all his undertakings. She has indeed been a *helpmate*, and (her husband would be the first to acknowledge) has contributed materially toward his successes.

In pursuance of the Editor's instructions, we visited Macclesfield—waited upon Dr. Beach at his school, and even before explaining the object of our visit, were welcomed with a fraternal cordiality which is one of his marked features. We at once commenced business.

'*Now, Dr. Beach, can you give us a few particulars concerning the past history of this school? We understand it has had a distinguished career.*'

'Yes, that is so. It dates back from 1841. We celebrated its Jubilee last year, when old scholars, even from New Zealand, Australia and America, practically manifested their attachment to '*the old school*' by their presence or liberal gifts. We have twice been specially commended in the "Blue Book," and at the Jubilee celebration, **Sir Wm. Hart-Dyke**, writing to W. Bromley-Davenport, Esq., M.P., said :—

"I am glad to hear that it it proposed to add a Technical side to Christ Church Schools, which are already among the best equipped and most efficiently conducted in the country." '

'*But can't you tell us something about your predecessors, as we understand you have only been here about ten years?*'

'Well, I do not claim, of course, to have done more here than keep abreast of the times. Previous teachers here have not only been efficient schoolmasters, but have distinguished themselves in other walks of life. Three are beneficed clergymen, viz., Rev. W. Ash, Rev. H. Green, Rev. J. B. Phillips; one, C. Dugard, Esq., a Sub-inspector of Schools; and another, J. G. Snelus, Esq., is a distinguished member of the British Iron and Steel Institute, and a FELLOW OF THE ROYAL SOCIETY.'

'*I notice that your scholars are of a superior class. Are they all Macclesfield children?*'

'Naturally, most of them are; but some come by train, some lodge in town, some are soldiers' children from the Barracks, and I am glad to say that others come from the Union House.'

'*With respect to the last mentioned children, don't you find that the question of caste arises?*'

'Scarcely at all, because our managers insisted upon three conditions: First, the children should be separated from the adults at the Union House itself; second, no uniform or distinguishing badge of any kind should be worn; third, the Casual children should not be sent.'

'*Your accommodation seems fully utilised. What is your number on books, and what the average attendance?*'

'Our numbers have increased so rapidly that repeated enlargements of premises have been necessitated. At present we have in the three Departments 740 in attendance, and during 1891 the attendances actually made reached 94 per cent. of the possible. **Sir Wm. Hart-Dyke**, when recently inspecting the School Registers at Whitehall, remarked that "This school needs no attendance officer." Our late School Board Clerk testifies that for 18 months there was no case of culpable irregularity.'

'*Do your Managers contemplate any further extensions?*'

'Yes; they have already bought the five adjacent houses, and we shall shortly utilise them for additional class-rooms and the imparting of Technical Instruction.'

'*They appear to be Progressive Educationists?*'

'All credit is due to them. They are *at* my back, but not *on* my back; and especially may be mentioned the Vicar, Rev. J. Wagstaff, B.D., a thorough educationist, and the Hon. Sec., Mr. J. Whalley, who has rendered yeoman service to the school for thirty years. From one manager or another I received upwards of 300 visits last year, the record of which I now show you in my log book.

'*Would you mind letting me see the official estimate of the school?*'

'With pleasure. Here are the last three reports :—

"The high character of the school is well maintained (1889)."

"The school continues excellent (1890)."

"The efficiency of this school is exceedingly well maintained (1891)."

'These Schedules for the 7 years preceding show under the Mundella Code an average of 98 per cent. of passes.

'The Drawing Reports you see are, with one exception, excellent.

'In Specifics we frequently have no failures; and more than half the Passes obtained in our Inspector's District are from this Department.'

'*Do you object to my inspection of the scholars' work and exercises?*'

'Certainly not.'

[We heard several four-part songs and two-part unseen tests; were allowed to examine in quadratic equations, shorthand, book-keeping, French correspondence, and in French and Latin grammar as far as the Irregular Verbs, and also saw a few exercises in Euclid and Greek. We can only say that art, accuracy and scholarship were self-evident.]

'*I see you have an excellent Museum. How was it formed?*'

'Well, there is no Royal Road to form a Museum. We enlisted managers, teachers, scholars, parents, friends, acquaintances, manufacturers, advertisers, and impressed everyone that we could influence. Help came from most unexpected sources, and the result is what you see. The bulk of this work fell upon Mrs. Beach, who was very often more successful than I could have been.'

'*And your Teachers' Library?*'

'A few books per quarter during ten years soon tell a tale. At present I am adding as fast as issued "Sir John Lubbock's One Hundred Books."'

George Beach

'*What is your Revised Scale of Fees under the Assisted Education Act?*'

'In addition to books, for which we received from the children £60 last year, the fees are: Standard I., 1d.; II., 2d.; III., 4d.; IV., 5d.; V., VI., VII., 6d.; Ex.-VII., Free.'

'*Have these relatively high fees adversely affected your numbers?*'

'On the contrary they have decidedly increased them. Both the vice of caste, and the virtue of independence, have combined to induce parents to send their children to this fee-paying school.'

'*I notice from your Summary that your school is opened little above the bare minimum number of requisite times.*'

'I never "keep in." I give as many half-holidays as possible. I take the elder scholars many walks, and the teaching staff numerous excursions. For instance, we have recently visited Dovedale, the Castleton Caves, Buxton, and the Liverpool Docks. These recreative outings furnish an agreeable break, re-invigorate the jaded energies, and stimulate the intelligence.'

At this juncture the clock struck four, and punctually we adjourned to Dr. Beach's hospitable residence, and after tea proceeded with our catechism.

'*By the bye, what do you think of the present Code?*'

'Why, it isn't absolutely faultless; as, for instance, in the Class and Specific Subjects it perpetuates the vicious system of *Payment by Results*; but it affords scope for individuality in both teachers and scholars. It is comparatively elastic; it dethrones the Inspector from the position of organizing master, if the Sample Method be adopted, and it minimises over-pressure and corporal punishment.'

'*Are you a believer in Corporal Punishment?*'

'Most decidedly; not in the first, but in the last resort. All government rests ultimately upon force; but he is the most skilful governor who appeals the least frequently to the basis of authority. Moreover, I can see no reason to debar my certificated assistants (who, if head teachers, would be legally authorised to inflict corporal punishment) from a judicious use of the cane or rod.'

'*Leaving this subject—Do you consider that the present method of annually visiting a school affords a rational basis, either for testing the efficiency, or for apportioning the Government subsidy?*'

'This query opens out a series of problems. I hope that the time is not far distant when County or District Councils will be the chief Local Educational authorities, the Department at Whitehall concerning itself simply with the three R.'s. There should be no fixed annual inspection, and no formal examination by inspectors, but many visits during the year, when the teacher might examine, and the inspector merely supplement.'

'*But what guarantee would* JOHN BULL *have that he was receiving value for his money?*'

'Why the testimony of JOHN BULL himself, who would soon discover the difference between pretence and reality—so-called accomplishments and intellectual training. This test is all that is required from doctors, lawyers and parsons. Besides, under the present hybrid regulations JOHN BULL has scarcely a right to demand an official test, inasmuch as teachers are not Civil Servants, except so far as pains and penalties can be inflicted. As you are aware, this non-recognition has proceeded so far that many worthy old teachers who were specifically promised pensions have had them withheld, although a gross breach of faith is thereby perpetrated.'

'*I should judge then that you, although a Churchman, disagree with Diocesan Examinations in Religious Knowledge?*'

'Emphatically so. I consider them the greatest drawback to vital religious instruction. They are a yoke upon the back of Church Teachers, who almost unanimously condemn them. Teachers have with one accord objected to the mechanical appraising by means of examination of the real results of secular instruction. How much less, then, can the efficient implanting of moral principles be thus adjudicated upon, and how much less is the necessity of adjudication, since no monetary grant is dependent thereon?

'I have been a Church of England Teacher for 15 years, and have never been under the harrow of Diocesan Inspection; but, nevertheless, not for one single day (except on examinations) has Religious Instruction been omitted or curtailed. Our clergymen come in every Tuesday morning to assist and examine.'

'*What is your opinion as to the Future of Voluntary Schools?*'

'They must, of course, keep pace with the times. They must be supported by the contributions and sacrifices of the friends of Religious Education. They must abolish *One-man-management*, and must admit representatives of parents upon their managing bodies. If these conditions be fulfilled the spirit of religion, the spirit of individualism, and the meaner spirit of economy, will co-operate to preserve Voluntary Schools.'

'*What will be the consequences, Doctor, do you think, of the Assisted Education Act?*'

'A new lease of life to Voluntary Schools, if they be wisely placed on a more Democratic basis; a differentiation of schools; and an impulse given to a recognised order of Secondary Schools.'

'*I observe that you are President of the Macclesfield and District Teachers' Association, and I therefore ask you what are your views with regard to the N.U.T.?*'

'I support most strenuously its "Forward policy," and believe in Trades Unionism, modified by the vital consideration of the highest good to the children.

Teachers ought to rise to the level of the sacrifices made by Colliers and Ironworkers, and a mild species of Boycotting should be instituted as regards Non-Union members, who selfishly profit by the sacrifices of the members of the N.U.T. For the election of the Executive there should be Electoral Districts, based, if possible, on County lines, in view of the increasing educational importance of County Councils.

After a little more desultory conversation, we took our leave, strongly impressed by Dr. Beach's individuality, the thoroughness, and extent of the work witnessed in the school; by his advanced views respecting education and teachers, and by the professional *esprit de corps* almost passionately displayed. Indeed, to touch upon imperfections, lightly and kindly, we are rather of opinion that perhaps an excess of combativeness—an eagerness for the fray—intruded itself.

These qualities—even those present in excess—render our friend a much-consulted man. We were shown a bundle of *private* letters—we should say at least 300—from nearly every part of the British Empire. Without any breach of confidence we were allowed an inspection sufficient to evidence that they covered nearly all phases of educational inquiry and pedagogic perplexity.

The mere fact that anyone is a teacher seems to be sufficient to constitute a claim.

Especially with respect to requests for legal advice, Dr. Beach's law studies and intimate acquaintance with decisions of My Lords render him competent to cope with the numerous demands made upon him.

CHRIST CHURCH (HIGHER GRADE) BOYS' SCHOOL, MACCLESFIELD.—TIME TABLE.

MORNING.

Day		9 to 9.15	9.15 to 9.50	9.50 to 10	10. to 10.40	10.40 to 11.20	11.20 to 12	12 to 12.15
Monday	Ex. VII.	Tables, Prayers, and Recording Punctuality.	Religious Instruction.	Registers finally closed.	French Corres.	Book-Keeping	Arithmetic	Dismissal and Disciplinary Detention.
	Class I.				Singing	Reading	Arithmetic	
	,, II.				Singing	Reading	Arithmetic	
	,, III.				Reading	Singing	Arithmetic	
	,, IV.				Reading	Singing	Arithmetic	
	,, V.				Writing	Grammar	Arithmetic	
	,, VI.				Writing	Grammar	Arithmetic	
Tuesday	Ex. VII.				Latin or Greek	History	Drawing	
	Class I.				Writing	Geography	Drawing	
	,, II.				Writing	Geography	Drawing	
	,, III.				Geography	Writing	Drawing	
	,, IV.				Writing	Reading	Drawing	
	,, V.				Reading	Writing	Drawing	
	,, VI.				Arithmetic	Writing	Drawing	
Wednesday	Ex. VII.				Algebra	Shorthand	Latin or Greek	
	Class I.				Algebra	Reading	Arithmetic	
	,, II.				Algebra	Reading	Arithmetic	
	,, III.				Reading	Writing	Arithmetic	
	,, IV.				Writing	Geography	Arithmetic	
	,, V.				Copy Books	Singing	Arithmetic	
	,, VI.				Copy Books	Singing	Arithmetic	
Thursday	Ex. VII.				Euclid	French Corres.	Arithmetic	
	Class I.				Reading	Map-Drawing	Arithmetic	
	,, II.				Reading	Map-Drawing	Arithmetic	
	,, III.				Drill	Reading	Arithmetic	
	,, IV.				Grammar	Writing	Arithmetic	
	,, V.				Geography	Grammar	Arithmetic	
	,, VI.				Geography	Reading	Arithmetic	
Friday	Ex. VII.	French			Latin or Greek	English	Algebra	
	Class I.	French			Writing	Grammar	Arithmetic	
	,, II.	Algebra			Writing	Grammar	Arithmetic	
	,, III.	Geography			Writing	Grammar	Arithmetic	
	,, IV.	Grammar			Reading	Writing	Arithmetic	
	,, V.	Reading			Writing	Drill	Arithmetic	
	,, VI.	Tables			Reading	Writing	Arithmetic	

AFTERNOON.

		1.30 to 1.45	1.45 to 1.50	1.50 to 2.30	2.30 to 3.10	3.10 to 3.50	3.50 to 4.0
	Ex. VII.	Tables, Prayers, and Recording Punctuality.	Registers finally closed.	Shorthand	French	English	Dismissal and Disciplinary Detention.
	Class I.			Writing	French	Grammar	
	,, II.			Writing	French	Grammar	
	,, III.			Grammar	French	Writing	
	,, IV.			Writing	Arithmetic	Geography	
	,, V.			Reading	Arithmetic	Singing	
	,, VI.			Reading	Arithmetic	Singing	
	Ex. VII.			French Corres.	French	Book-Keeping	
	Class I.			Arithmetic	French	Singing	
	,, II.			Arithmetic	French	Singing	
	,, III.			Arithmetic	Singing	Reading	
	,, IV.			Arithmetic	Singing	Grammar	
	,, V.			Arithmetic	Geography	Writing	
	,, VI.			Arithmetic	Writing	Reading	
	Ex. VII.			Euclid	History	English	
	Class I.			Arithmetic	Drill	Writing	
	,, II.			Arithmetic	Drill or Man. Trng	Writing	
	,, III.			Arithmetic	Reading	Writing	
	,, IV.			Writing	Reading	Drill	
	,, V.			Arithmetic	Writing	Reading	
	,, VI.			Writing	Grammar	Reading	
	Ex. VII.			Manual Training	Book-Keeping	Shorthand	
	Class I.			Manual Training	Algebra	Geography	
	,, II.			Manual Training	Algebra	Geography	
	,, III.			Manual Training	Algebra	Writing	
	,, IV.			Manual Training	Reading	Arithmetic	
	,, V.			Manual Training	Reading	Writing	
	,, VI.			Manual Training	Writing	Drill	
	Ex. VII.			1.30 to 2.50		2.50 to 3.50	
	Class I.			Drawing		Singing	
	,, II.			Drawing		Singing	
	,, III.			Drawing		Singing	
	,, IV.			Drawing		Singing	
	,, V.			Drawing		Singing	
	,, VI.			Drawing		Singing	

Liberty is reserved to substitute :—(I.) Any one of the three R's for any other.
(II.) Drawing, Grammar, and Geography for Grammar, Geography, Drawing, etc.
(III.) French, Algebra, Drill, Singing for Algebra, Drill, Singing, French, etc.

We may add that the LL.D. excuses its possessor from about fifteen-sixteenths of the examinations required to be passed for a Barristership.

In the Public Press, at Local and National Conferences, and as a Deputation to Whitehall from the Macclesfield and District Teachers' Association, he has with considerable success defended and advanced the rights and status of his brethren. Of the last organisation mentioned he is President, its Representative on the Cheshire Teachers' County Council, and its Delegate to the sub-committee of two, appointed to administer the Macclesfield share of the sum of £1,000 granted by the County Council towards the Technical Training of Teachers.

In social and political life equal activity is exerted. Besides being President or Vice-President of various organisations Dr. Beach is the energetic captain both of the Macclesfield Cricket and Chess Clubs. He is a strong believer in the *mens sana in corpore sano* ; and, as aforesaid, often takes long pedestrian excursions with scholars or teaching staff.

To the principal Chess Journals he has been a frequent contributor, the first game inserted in the *Schoolmaster* being a brilliant one of his playing.

During his stay at Cheadle he contested single-handed, on behalf of the local club, the correspondence games with the Birmingham Chess Club, and won them both—one being inserted with very high commendations in the *Chess Players' Chronicle*.

The following 'trifle' from Dr. Beach's pen went the round of nearly every English chess column in the world, and was also translated into Italian, Spanish, and German.

A SENTIMENTAL RETROSPECT.

My mind goes back before I wed,
When first caressing her dear head
With rapid-beating heart I said—
My Queen.

Her sweet reply came back to me ;
Her downcast looks I still can see ;
Her whispered words with these agree—
My King.

When loss of friends and loss of store
Distressed her mind and grieved her sore,
Who fought and toiled for her the more ?—
Her Knight.

Who joined our hands and called us one,
Putting the holy seal upon
What was but one in times past gone ?
The Bishop.

Now safely housed in this dear land,
We often, clasping hand in hand,
Talk of old times before we planned—
Our Castle.

And coursing round my chair there speed
Eight sturdy imps who me impede,
Yet are the 'soul of life' indeed—
My Pawns.

These stanzas naturally remind us of Dr. Beach's literary abilities and productions.

In them he displays that conscientious labour, that power of condensation and that clear logicality of mind which might have been expected; whilst on occasion, but never obtrusively, a subtle vein of humour crops out. To these columns he has been for four years a constant, esteemed and much utilised contributor. Particularly to Pupil Teachers, Scholarship and Certificate Candidates have his articles been serviceable, as numerous unsolicited commendations prove. Subjoined is a list of his chief works :—

'ENTERTAINING READERS,' which have been adopted by the leading School Boards, and respecting which the unanimous verdict is '*Dr. Beach's Readers are the best we have ever seen.*'

ARITHMETICAL TEST CARDS most carefully graduated on an original system, and of which the **Teachers' Aid** reports, '*They stand first in the market*' ; and the **Educational Times** '*They will be an immense relief to the Teacher.*'

'ELEMENTS OF ENGLISH' which has been adopted by English and Scotch Training Colleges, and by London and Provincial Pupil Teacher Centres.

The **Schoolmaster** says of this, '*The definitions and explanations are simple without being unscientific ; every part of the subject is well illustrated by examples, and enforced by specimen-questions from various Examination Papers. The History of the Language is well-treated in a necessarily concise but comprehensive manner.*'

GIRLS' ARITHMETIC (in conjunction with A. C. Dixon, M.A., Senior Wrangler, and Fellow of Trinity College, Cambridge).

Of this work the **Teachers' Aid** says, '*The collaboration of a Senior Wrangler with the master of a Public Elementary School has produced the practical yet scholarly result which might have been anticipated. The Teacher will find the book a sure guide to intelligent teaching.*'

The **University Correspondent** writes, '*A book like this, which gives prominence to methods of Teaching, and explains minutely the reasons of all rules, is especially valuable to Girls.*' The **Schoolmaster** says, '*The different chapters are comprehensive in character and have been constructed with care, one great object being to combine theory with practice—to endeavour not only to give problems for solution, but to obtain reasons for the steps by which the answer is to be attained.*' This Manual also has been adopted in Training Colleges and Pupil Teacher Centres.

'OUR MOTHER TONGUE.' This is an exhaustive and scholarly work of 850 pages, expanded from a smaller volume on the same lines by H. M. Hewitt, M.A., LL.M., late Examiner for the Universities of Cambridge and London. The many highly-complimentary reviews of this work assert it to be, beyond all doubt, the best book of the kind.

Dr. Beach is at present engaged upon a comprehensive work entitled 'THE SCIENCE AND ART OF EDUCATION.'

Our concluding words must be those of congratulation to Dr. Beach, coupled with the expressed hope that for many ensuing years life, health and energy may be preserved to him, not only for his own happiness, but for the benefit of others.

As he is yet on the right side of forty, we believe that further advancement awaits him. Why to such Teachers, whose scholarship and professional skill are beyond all disparagement, is promotion to an Inspectorship denied ?

LA JEUNE SIBÉRIENNE.

TRANSLATED BY PROFESSOR DARQUÉ—*(Author of 'Pupil Teachers' French Course.')*

La Jeune Sibérienne.

Lorsqu'elle eut fait quelques verstes hors du village, elle eut la curiosité de compter son argent. Le lecteur sera sans doute aussi surpris qu'elle le fut elle-même en apprenant qu'au lieu de quatre-vingts kopecks qu'elle croyait avoir, elle en trouva cent vingt. Ses hôtes en avaient ajouté quarante.

Prascovie aimait à redire cette aventure, comme une preuve évidente de la protection de Dieu, qui avait changé tout à coup le cœur de ces malhonnêtes gens. Quelque temps après, elle courut un danger d'une autre espèce et qui l'effraya beaucoup. Comme elle avait un jour une longue traite à faire, elle partit à deux heures du matin de la station où elle avait couché. Au moment de sortir du village, elle fut attaquée par une troupe de chiens qui l'entourèrent. Elle se mit à courir, en se défendant avec son bâton, ce qui ne fit qu'augmenter[241] leur rage. Un de ces animaux saisit le bas de sa robe[242] et la déchira. Elle se jeta à terre en se recommandant à Dieu. Elle sentit même avec horreur un des plus obstinés appuyer son nez froid sur son cou pour la flairer. 'Je pensais, disait-elle, que Celui[243] qui m'avait sauvée de l'orage et des voleurs me préserverait aussi de ce nouveau danger.' Les chiens ne lui firent aucun mal : un paysan qui passait les dispersa.

La saison avançait : Prascovie fut retenue près de huit jours dans un village par la neige, qui était tombée en si grande abondance que les chemins étaient impraticables aux piétons. Lorsqu'ils furent suffisamment battus par les traîneaux, elle se disposait courageusement à continuer sa route à pied ; mais les paysans chez lesquels elle avait logé l'en dissuadèrent[244] et lui en firent voir le danger. Cette manière de voyager devient alors impossible aux hommes même les plus robustes, qui périraient infailliblement, égarés dans ces déserts glacés, lorsque le vent chasse la neige et fait disparaître les chemins.

Son bonheur amena dans ce village un convoi de traîneaux qui conduisaient des provisions à Ekatherinembourg[245] pour les fêtes de Noël.[246] Les conducteurs lui donnèrent une place sur un de leurs traîneaux. Cependant, malgré les soins que ces braves[247] gens prenaient d'elle, ses habits n'étant point assortis à la saison, elle avait bien de la peine à supporter la rigueur de l'hiver, enveloppée dans une des nattes destinées à couvrir les marchandises. Le froid devint si violent, pendant la quatrième journée, que, lorsque le convoi s'arrêta, la voyageuse, transie, n'eut pas la force de descendre du traîneau. On la transporta dans le

The Young Siberian.

When she had gone a few versts out of the village, she had the curiosity to count her money. The reader will doubtless be as surprised as she was herself on finding that instead of eighty kopecks that she thought she had, she found one hundred and twenty. Her hosts had added forty of them.

Prascovie was fond of repeating this adventure, as an evident proof of the protection of God, who had all at once changed the heart of those dishonest people. A short time afterwards, she ran a danger of another kind and which frightened her very much. As she one day had a long journey to go, she set out at two o'clock in the morning from the place where she had slept. At the moment of going out of the village, she was set on by a number of dogs which surrounded her. She began to run, protecting herself with her stick, which only increased their rage. One of those animals caught the hem of her dress and tore it. She threw herself on the ground commending herself to God. She even felt with horror one of the most obstinate putting its cold nose on her neck in order to smell her. 'I thought, she said, that He who had saved me from the storm would also preserve me from this new danger.' The dogs did her no harm : a peasant who was going by sent them away.

The season was far gone : Prascovie was detained nearly a week in a village by the snow, which had fallen in so great a quantity that the roads were impracticable for foot passengers. When they were sufficiently trodden by sledges, she was courageously getting ready to continue her journey on foot ; but the peasants at whose house she was staying dissuaded her from it and made her see the danger of it. This mode of travelling becomes then impossible even for the strongest men, who would infallibly perish, lost in those frozen deserts, when the wind drives the snow which obliterates every trace of roads.

Her luck brought into this village a convoy of sledges which were carrying provisions to Ekatherinemburg for the Christmas holidays. The conductors offered her a seat in one of their sledges. Yet, in spite of the care which those kind people took of her, her clothing not being suited to the season, she had much difficulty to bear the severity of winter, wrapped up in one of the mats intended to cover the goods. The cold became so intense, during the fourth day's journey, that, when the convoy stopped, the traveller, benumbed with cold, had not sufficient strength to alight from the sledge. They carried her into the kharstma, a

Notes.

(241) Notice particularly the following expressions : *il ne fait que manger*, he does nothing but eat ; *il ne fait que de manger*, he has just eaten.

(242) *Le bas de sa robe*, literally 'the bottom—lower part—of her dress.'

(243) *Celui qui*. In expressions of this kind the French invariably use the demonstrative pronoun.

(244) *L'en dissuadèrent*. *En* might here perhaps be best rendered by 'from doing so.'

(245) *Ekatherinemburg*, a town in Asiatic Russia, on the eastern side of the Ural mountains.

(246) *Noël*. *Un noël*, a Christmas carol. *La Noël*, i.e., *la fête de Noël*, Christmas.

(247) When *brave* follows the noun it means 'courageous.'

kharstma,[248] auberge isolée à plus de trente verstes de toute habitation, et où se trouvait la station de la poste aux chevaux. Les paysans s'aperçurent qu'elle avait une joue[249] gelée et la lui frottèrent avec de la neige, en prenant le plus grand soin d'elle ; mais ils refusèrent absolument de la conduire plus loin, et lui représentèrent qu'elle courait le plus grand danger en s'exposant à voyager sans pelisse par un froid si vif, et qui ne manquerait pas[250] d'augmenter encore. La jeune fille se mit à pleurer amèrement, prévoyant qu'elle ne trouverait plus une occasion aussi favorable et d'aussi bonnes gens pour la conduire. D'autre part, les maîtres[251] du kharstma ne paraissaient point du tout disposés à la garder et voulurent à toute force[252] qu'elle partît avec ceux qui l'avaient amenée. Dans cette position embarrassante, se voyant déçue de l'espoir qu'elle avait d'aller jusqu'à Ekatherinembourg en sûreté, elle s'abandonnait, dans un coin de la chambre, à toute la vivacité de sa douleur.

Ses conducteurs furent touchés de sa situation ; ils se cotisèrent[253] pour lui acheter une pelisse de mouton qui, dans le pays, ne coûte que cinq roubles ; malheureusement il ne s'en trouva point à vendre : aucun des habitants de cette ville[254] isolée ne voulut faire le sacrifice[255] de la sienne, parce qu'il était difficile de la remplacer. Les paysans offrirent jusqu'à sept roubles à une fille de l'auberge, qui les refusa. Dans cette perplexité, un des plus jeunes conducteurs proposa tout à coup un expédient des plus singuliers, et[256] qui permit à Prascovie de profiter de leur bonne volonté. 'Nous lui prêterons, dit-il, tour à tour nos pelisses, ou bien elle prendra la mienne une fois pour toutes, et nous changerons entre nous à chaque verste.' Ils y consentirent tous avec plaisir. On fit aussitôt le calcul de la distance et du nombre de fois que les pelisses devaient être changées : les paysans Russes veulent savoir leur compte, et se laissent difficilement tromper. La voyageuse fut placée sur un traîneau, bien enveloppée dans sa pelisse. Le jeune homme qui la lui avait cédée se couvrit avec la natte dont elle s'était servie jusqu'alors, et, s'asseyant sur ses pieds,[257] se mit à chanter à tue-tête[258] et ouvrit la marche. L'échange des pelisses se fit exactement à chaque poteau des verstes,[259] et le convoi parvint très-heureusement et très-vite à Ekatherinembourg.

Pendant toute la route, Prascovie ne cessa de prier Dieu pour que la santé de ses conducteurs ne souffrît pas de leur bonne action.

En arrivant à Ekatherinembourg, Prascovie logea[260] dans la même auberge que ses conducteurs. L'hôtesse, apprenant de ces derniers une partie des aventures de la jeune fille, et jugeant, d'après leur récit, qu'elle était sans argent, lui fit aussitôt l'énumération[261] des personnes de la ville qui passaient pour être les plus généreuses, et lui conseilla de s'adresser à elles pour obtenir leur protection et les secours

lonely inn more than thirty versts distant from any house, and where was the posting-house. The peasants perceived that one of her cheeks was frozen, and they rubbed it with snow, whilst taking the greatest care of her ; but they absolutely refused to take her any farther, and showed her that she ran the greatest danger by exposing herself to travel without a pelisse during so intense a cold, and which would not fail to increase still. The young girl began to cry bitterly, foreseeing that she would no longer find so favourable an opportunity and such kind people to carry her. On the other hand the masters of the kharstma did not seem at all inclined to keep her and insisted on her setting out with those who had brought her. In this embarrassing situation, seeing herself disappointed in the hope she had *entertained* of going safely as far as Ekatherinemburg, she gave way, in a corner of the room, to her intense grief.

Her conductors were moved by her position ; they clubbed together to buy for her a sheep-skin pelisse, which, in the country, only costs five roubles ; unfortunately there was none for sale ; none of the inhabitants of that lonely place would part with his own, because it was difficult to replace it. The peasants offered as much as seven roubles to a girl of the inn, who refused them. In this perplexity, one of the youngest conductors all at once proposed one of the most singular expedients, which enabled Prascovie to benefit by their good will. 'We shall lend her, he said, our pelisses by turns, or else she will take mine once for all, and we shall change among ourselves at every verst.' They all agreed with pleasure. They at once reckoned the distance and the number of times that the pelisses were to be changed. Russian peasants are most particular in their transactions, and are not easily deceived. The traveller was placed on a sledge, well wrapped up in her pelisse. The young man who had lent it to her covered himself with the mat which she had used till then, and, seating himself on his feet, began to sing at the top of his voice and opened the march. The exchange of pelisses took place exactly at each verst-post, and the convoy reached Ekatherinemburg quite safe and very quickly.

During the whole journey, Prascovie did not cease praying to God in order that the health of her conductors should not suffer through their kind action.

On her arrival at Ekatherinemburg, Prascovie put up at the same inn as her conductors. The hostess, hearing from the latter a part of the adventures of the young girl, and guessing, from their narrative, that she had no money, told her at once the names of the persons in the town who had the reputation of being most charitable, and advised her to apply to them in order to obtain their protection and the help necessary

(248) *Kharstma*, a kind of inn in the Russian empire.

(249) *Elle avait* shows plainly enough who was the owner of the cheek ; hence the use of the article before *joue* instead of the possessive pronoun.

(250) *Ne manquerait pas* would perhaps be more idiomatically rendered by 'would be sure.'

(251) *Maîtres*, here 'landlord and landlady.'

(252) *Voulurent à toute force*, i.e., *avec toute leur force*, with all their might.

(253) *Se cotiser*, to contribute equally. Cf., *écot*, scot, and *cote*, quotation.

(254) *Ville*. This is evidently a clerical error, since we were told some twenty lines before that the kharstma was more than thirty versts distant from the nearest house.

(255) *Faire le sacrifice de la sienne*. 'Her own' would perhaps be more correct, as the self-denial required was more likely to be expected from a woman than a man.

(256) *Et*. The necessity of this conjunction is not quite evident, if it was not intended as a mere sign of emphasis.

(257) *S'asseyant sur ses pieds* is more seldom used than *s'accroupissant*, squatting (negro fashion).

(258) *Chanter à tue-tête* is doubtless a contraction of *chanter assez fort pour tuer la tête*, to sing loud enough to kill the head.

(259) *Poteau des verstes*. Wooden posts for this purpose correspond to our 'milestones,' stone being relatively much dearer in Russia.

(260) *Descendit* is now more usual than *logea* in reference to travellers who either ride or drive.

(261) *Faire l'énumération*, literally 'to count.'

nécessaires pour le long voyage qu'elle avait à faire. Elle loua[363] beaucoup, entre autres, une dame Milin,[363] du caractère le plus obligeant, qui faisait beaucoup de bien aux pauvres, et dont la bonté était connue de toute la ville. Les gens de l'auberge confirmèrent la vérité de ce portrait. Lors[364] même que la voyageuse n'aurait pas compris l'intention de l'hôtesse, elle aurait été forcée de chercher un autre gîte. L'auberge était ce qu'on appelle en Russe *postoallerōī dvor*[365] (maison de repos). Elles sont ordinairement formées d'un vaste hangar pour les chevaux, qui n'a que le toit pour couverture, et dans l'angle duquel est une serre chaude[366] qui en occupe la quatrième partie.[367] Les voyageurs s'arrangent comme ils peuvent dans cette pièce unique, dont le plancher sert de lit à ceux qui ne peuvent avoir de place sur le poêle. Le lendemain, Prascovie sortit d'assez bonne heure,[368] dans l'intention de se rendre chez Mme. Milin ; mais, suivant son habitude, elle commença par aller à l'église, où se trouvait plus de monde[369] qu'elle n'en avait jamais vu rassemblé. C'était un dimanche. La ferveur qu'elle mit à ses prières la fit autant remarquer que le sac et le costume qu'elle portait, et qui annonçait une étrangère voyageuse. Au sortir de[370] l'église, une dame lui demanda qui elle était. Prascovie satisfit à sa demande en quelques mots, et, se disposant bientôt à la quitter, lui fit part[371] de l'intention où elle était d'aller demander l'hospitalité à Mme. Milin, dont tout le monde lui avait appris la bienfaisance et l'humanité. Elle parlait à Mme. Milin elle-même, qui entendait ainsi son éloge d'une manière qui ne pouvait lui être suspecte de flatterie. Cette bonne dame, avant de se faire connaître à la voyageuse, voulut s'amuser un instant de son embarras. 'Cette dame Milin, dit-elle, qu'on vous vante tant, n'est pas aussi bienfaisante que vous l'imaginez.[372] Si vous voulez m'en croire[373] et venir avec moi, je vous procurerai un bien meilleur gîte.'

D'après tout le bien qu'on lui avait dit de Mme. Milin à l'auberge, Prascovie prit une mauvaise idée de sa nouvelle connaissance : elle la suivit sans oser refuser et sans accepter sa proposition. 'Au reste, lui dit Mme. Milin, voyant qu'elle ralentissait le pas, si vous tenez si fort à[374] vous rendre chez cette dame, voici sa maison, à deux pas[375] d'ici : entrons chez elle, vous verrez comment vous y serez reçue ; mais promettez-moi que, si l'on ne vous y retient[376] pas, vous viendrez avec moi.' Prascovie, sans répondre, entra dans la maison, et s'adressant aux femmes de Mme. Milin, leur demanda si leur maîtresse était chez elle. Les femmes, étonnées de cette question faite en présence de leur maîtresse elle-même, ne répondirent rien. 'Puis-je voir Mme. Milin ? répéta la voyageuse. — Mais, dit enfin une des femmes, la voilà !'[377] Prascovie, en se retournant, vit Mme. Milin qui ouvrait les bras pour la recevoir. 'Oh ! je savais bien que

for the long journey she had to go. She praised a great deal, among others, a Mrs. Milin, a most obliging person, who did much good to the poor, and whose kindness was known to the whole town. The people at the inn corroborated the truthfulness of that portrait. Even if the traveller had not understood the intention of the hostess, she would have been obliged to look for another lodging. The inn was what is called in Russia a house of rest. They generally consist of a very large shed for the horses, which is only covered by the roof, and in a corner of which there is a very warm room which occupies a fourth part of it. The travellers establish themselves as *best* they can in that only room, the floor of which is used as a bed by those who cannot find room on the stove. The next day Prascovie went out pretty early, with the intention of going to Mrs. Milin's ; but, as was her custom, she first went to church, where there were more people than she had ever seen together. It was a Sunday. The fervour with which she prayed caused her to be noticed as much as did her bag and the dress she wore, and which denoted a foreign traveller. On coming out of the church, a lady asked her who she was. Prascovie satisfied her demand in a few words, and, intending soon to leave her, imparted to her the resolution she had formed to go and ask hospitality of Mrs. Milin, of whose benevolence and kindness every one had spoken to her. She was speaking to Mrs. Milin herself, who thus heard her praises in a way that could not be suspected of flattery. This good lady before making herself known to the traveller, wished to amuse herself for a moment about her embarrassment. 'This Mrs. Milin, she said, whom they praise so much to you, is not so benevolent as you fancy. If you will believe me and come with me, I will get you far better quarters.'

After all the good they had told her of Mrs. Milin at the inn, Prascovie conceived an unfavourable opinion of her new acquaintance : she followed her without daring to refuse, yet without accepting her proposal. 'Besides, Mrs. Milin said to her, when she saw her slackening her pace, if you are so intent on going to that lady's, this is her house, close by : let us go in, you will see how you are received ; but promise me that if they do not insist on your staying, you will come with me.' Prascovie, without answering, entered the house, and addressing Mrs. Milin's servants, inquired of them whether their mistress was at home. The servants, astonished at this question asked in presence of their mistress herself, answered nothing. 'Can I see Mrs. Milin ? repeated the traveller. — But, one of the women said at last, there she is !' Prascovie, turning round, saw Mrs. Milin who was opening her arms to welcome her. 'Oh ! I was quite sure that Mrs. Milin could

(363) Do not mistake *louer*, to praise, for *louer*, to hire, to let.

(363) *Une dame Milin*. We would now say *Madame Milin*, the former expression seeming rather disparaging for a lady of her character.

(364) *Lors* is here equivalent to *alors*.

(365) *Postoallerōī dvor*, a town or village inn, the kharstma being a roadside inn.

(366) *Une serre chaude* now means only 'a hothouse' for plants.

(367) *Un quart* is more often used than *une quatrième partie*.

(368) *D'assez bonne heure*, literally 'early enough.'

(369) *Monde*, literally 'world.' Notice : *il connaît tout le monde*, he knows everybody ; *il va dans le monde*, he goes into society ; *le grand monde*, the upper classes.

(370) *Au sortir de* stands most likely for *au moment de sortir de*.

(371) *Faire part*, to acquaint. Notice : *billet de faire part*, a note sent to friends to inform them of the birth, marriage, or death of some of their acquaintance.

(372) Whenever an adjective, a participle, an adverb, or even a whole clause is understood or implied in a subordinate sentence, the French invariably supply its place by *le*. Here we might say *que vous imaginez qu'elle est bienfaisante*.

(373) *M'en croire*. *En* here stands for 'about the matter.'

(374) Notice also : *il tient à cette bague*, he is fond of that ring ; *il ne tient qu'à vous*, it only depends on you.

(375) *Pas* literally means 'pace.'

(376) Literally 'if they do not detain you there.'

(377) In answer to questions concerning the whereabouts of persons and things, the French mostly say *le* (*la—les*) *voici*, *le* (*la—les*) *voilà*. *Voilà* is a compound of *vois*, behold, and *là*, there.

Mme. Milin ne pouvait pas être une méchante femme,' dit la jeune fille en lui baisant les mains. Cette petite scène fit le plus grand plaisir à sa bienfaitrice.

not be an unkind woman,' said the young girl kissing her hands. This little scene gave the greatest pleasure to her benefactress.

(*To be continued.*)

SPECIMEN NOTE, TIME, AND EAR TESTS FOR THE CODE EXAMINATION.

BY W. G. MCNAUGHT,
Associate of the Royal Academy of Music.

DIVISION III.—STANDARDS III. AND IV.

NOTE TEST.

Tonic Sol-fa.—Note Test (*Modulator*).—(*a*) To Sol-fa from the Examiner's pointing on the modulator, or from dictation, in any key, simple passages in the major diatonic scale, including **fe** and **ta** in stepwise progression, used thus, **s fe s—d' ta l.**

Example :—

d m s l s m f r s f m s d' t l s fe s f m s d' ta l s l t d' s m d.

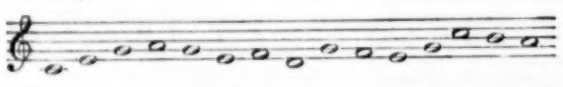
Note Test.—(*Written or printed*)—(*b.*) To Sol-fa at sight a written or printed exercise, including the notes of the *Doh* chord in any order, and any other notes of the major diatonic scale in stepwise succession. The exercise not to contain any difficulties of time.

Example :—

|d : d | m : r | d : m | s : f | m : s | l : s | l : t | d' : — ||

Staff Notation.—Note Test.—1. To sing slowly as directed by the Examiner's pointer, using the Sol-fa syllables, a series of notes in the key of C, containing an F sharp contradicted by an F natural, and a B flat contradicted by a B natural. The F sharp should be approached by the note G and return to G as in the example, and the B flat should be approached by C, and be followed by A as in the example.

Example :—



PRELIMINARY TESTS.

Pupils in this Division are expected to be able to leap freely from tone to tone of the major scale. It is far more difficult to attain this skill than to sing **fe** and **ta** with the easy surroundings laid down in the requirements. A leap in the scale is generally difficult or easy according to what has gone before. Thus it is quite easy to find **d** to **l**, if, say **s l s** have come just before. Exercises 58 to 63 above, introduced some common leaps. The following exercises illustrate more difficult leaps.

(For Modulator.)

Doh as C or D.

(96) **d s d d' f m s d' d f m r s d f t, d ||**
(97) **m r s d f s l f t d' m s d d' t d' d ||**
(98) **s m f r m d' f l r m s l d' t d' r d ||**
(99) **d' t l s d f m r s d l s m d' f l s t d' ||**
(100) **m s f l s d r f t, d m s l r s d' t d' d ||**

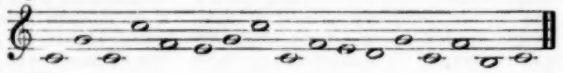
Doh as F or G. Range about **s,** to **s.**

(101) **d s, m d t, r s, m s d r t, d s, t, r d ||**
(102) **m r d s s, l, d l, d m r m d s, r t, d ||**
(103) **d t, d m s f m s s, l, s, d m r d t, d s, m r d ||**
(104) **d s, l, s, m d s, s f m r f t, d r s, l, s, d r d ||**

Staff Notation.

Teachers are again urged not to confine their tests to the one key (C) asked for in the requirements. It will be increasingly difficult to Sol-fa (moveable Doh) in other keys at a later stage if pupils are too used to the key of C.

96.



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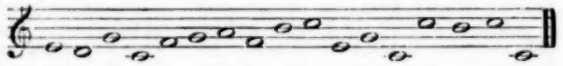
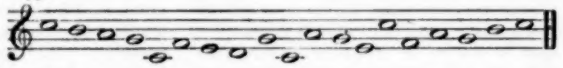


98.

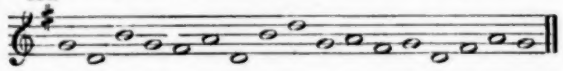
99.



100.

Range Soh, to Soh (beyond the Code as to Key).

101.



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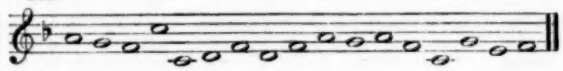

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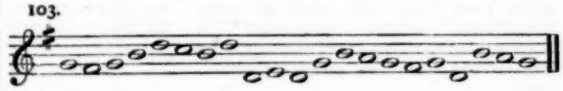

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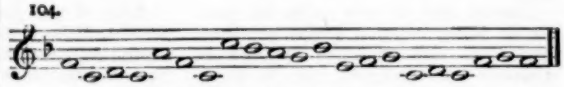


Introducing *fe*, the sharp fourth.

Fe, the sharp fourth of the scale, should be practised in association with *fah*. It should not immediately follow or precede *fah*, thus: **s fe f** or **f fe s**, but should be approached and quitted thus, **s fe s f m** or **s f m s fe s.**

Tonic Sol-fa Notation.

Doh as C or D.

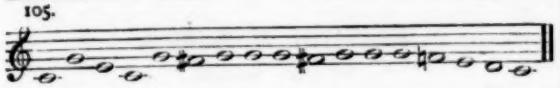
(105) **d s m d s fe s s s fe s s s f m r d ||**
(106) **m r d m s fe s s f m s fe s f m r d ||**
(107) **d m s d' s s f m s fe s s f m f m s d' ||**
(108) **m s d s f m r s fe s f m s l s fe s f m r d ||**

Range about **s,** to **s.**

Doh as F or G.

(109) **m r d s, d m s s fe s f m r m d ||**
(110) **d t, d s, fe, s, l, t, d m s f m r d ||**
(111) **s m f r d m s fe s l s f m s d ||**
(112) **m s d r m f m s fe s f m r m f t, d ||**

105.



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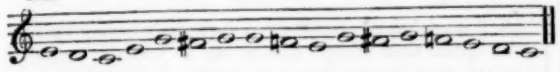

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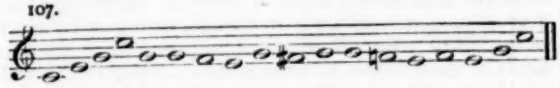

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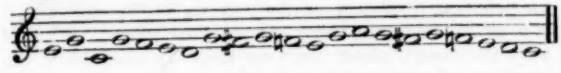
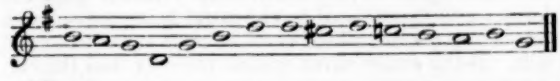


Range about S_1 to S (beyond the Code as to Key).

109.



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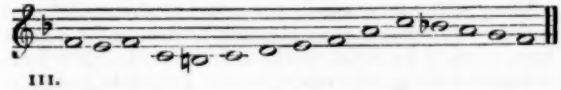
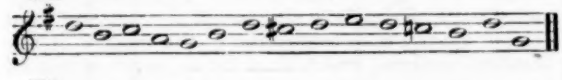


111.



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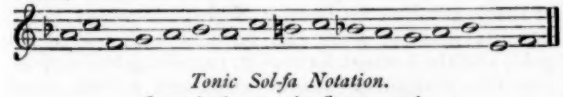


Tonic Sol-fa Notation.

Introducing *ta*, the flat seventh.

Ta, the flat seventh, should be practised in association with *te*. It should not immediately follow or precede *te*, thus: **d' t ta l** or **l ta t**, but should be approached and quitted thus: **d' ta l t d'** or **d' ta l s t d'**.

Doh as C or D.

(113) **d m s m d' ta l l d' ta l l t t d' ||**
(114) **d s m s d' ta ta l l t d' s s l t d' ||**
(115) **d r m d s l s t d' d' ta l t t d' ||**
(116) **m s d f m d' t l s d' ta l s t d' ||**

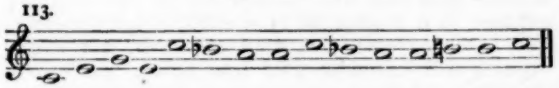
Range s_1 to **s**.

Doh as F or G.

(117) **d t_1 d s_1 d ta_1 l_1 l_1 t_1 d r t_1 d s_1 d ||**
(118) **d r m d d ta_1 l_1 d ta_1 ta_1 l_1 l_1 t_1 t_1 d ||**
(119) **m d s_1 d t_1 d r d d ta_1 l_1 t_1 d r d ||**
(120) **d r m d s_1 d ta_1 l_1 t_1 d r t_1 d ta_1 l_1 t_1 d ||**

Staff Notation.

113.



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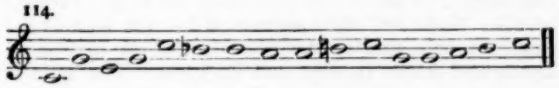

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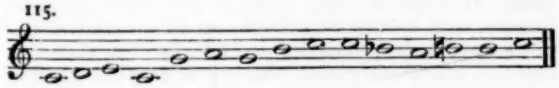

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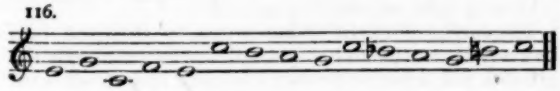
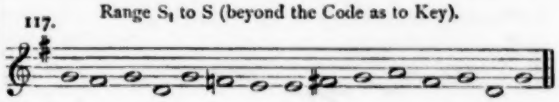
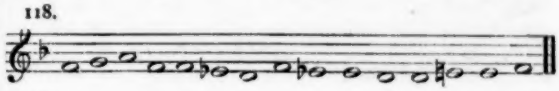


Range S_1 to S (beyond the Code as to Key).

117.



118.



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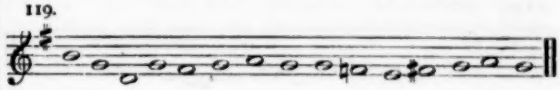
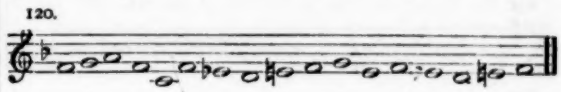


120.



STANDARD TESTS.

Tonic Sol-fa (Modulator).

Doh as C, D, or E♭.

(121) **d s m d' s f l s fe s f m d' s d' ta l s t d' ||**
(122) **m s d f r m s f m s fe s d' m d' ta l l t d' ||**
(123) **s d r f m s d t_1 d s fe s f m r t d' ta l t d' ||**
(124) **d' t l s f m s fe s m r f m d' t d' ta ta l t d' ||**
(125) **d' s t d' ta l t d' m s fe s f m r d s l t d' ||**
(126) **m s d d' ta ta l s t d' f l r s fe s f r d ||**

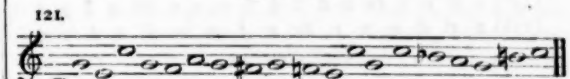
Range about s_1 to **s**.

Doh as F, G, or A.

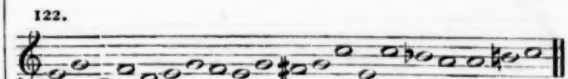
(127) **d t_1 r d m s d ta_1 l_1 t_1 d r m d s fe s f m r d ||**
(128) **m r d t_1 d s_1 l_1 s_1 fe_1 s_1 t_1 d r d ta_1 l_1 t_1 d r m d ||**
(129) **d m r d ta_1 l_1 t_1 d m s fe s f m r f t_1 r d ||**
(130) **m s d r s_1 l_1 t_1 d ta_1 l_1 t_1 d s_1 fe_1 s_1 l_1 t_1 d m r d ||**
(131) **d s_1 d t_1 d ta_1 l_1 t_1 d r m d s fe s f m d r t_1 d ||**
(132) **m d t_1 d s_1 fe_1 s_1 d r t_1 d ta_1 l_1 t_1 d m r s_1 d ||**

Staff Notation.

121.



122.



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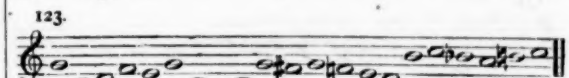

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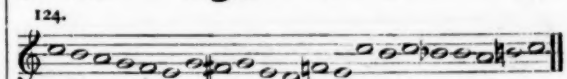

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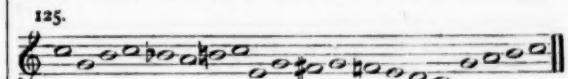
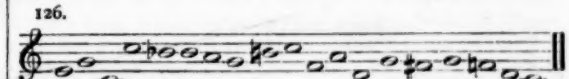
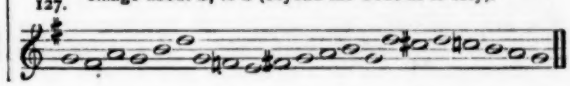


126.

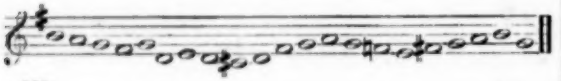


Range about S_1 to S (beyond the Code as to Key).

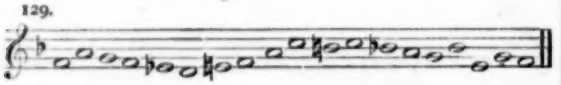
127.



128.



129.



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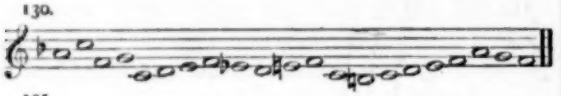

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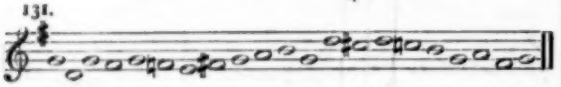

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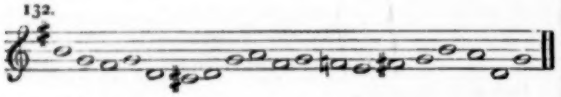


WRITTEN OR PRINTED TESTS.

As these are directed to be no more difficult than the modulator tests for Division II., the tests already given for that Division will suffice if used as blackboard exercises.

BEYOND THE CODE.

(Especially for Standard IV., when taught separately.)

Tonic Sol-fa.

The modulator tests (96 to 132 above) should be used as blackboard tests. Singing to *lah* after Sol-faing should be practised. Common leaps to *fe* and *ta* should be studied.

Leaps to *Fe*.

Doh as C or D.

(133) d m s d' d m fe s s l f m s f r d ||
(134) s m d d' s l fe s f m d' s l s t d' ||
(135) d r m s m r fe s s l t d' m s t_1 d ||
(136) d s m s t d' fe s l f r s m d r d ||

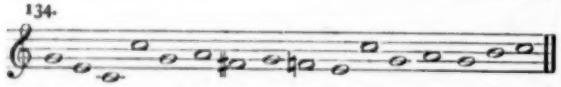
Range about s_1 to s.

(137) m d s_1 l_1 fe_1 s_1 d t_1 d f m s m fe s f r d ||
(138) s m d s_1 m r fe s f m r f t_1 d r d ||

Staff Notation.

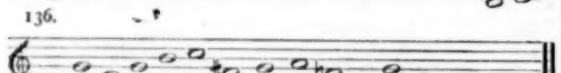
133.

134.



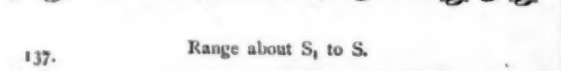
135.

136.

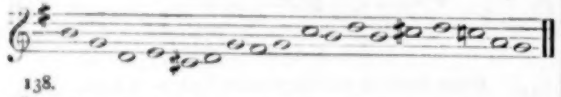


Range about S_1 to S.

137.



138.



DECORATIVE NEEDLEWORK.

BY MAY MORRIS.

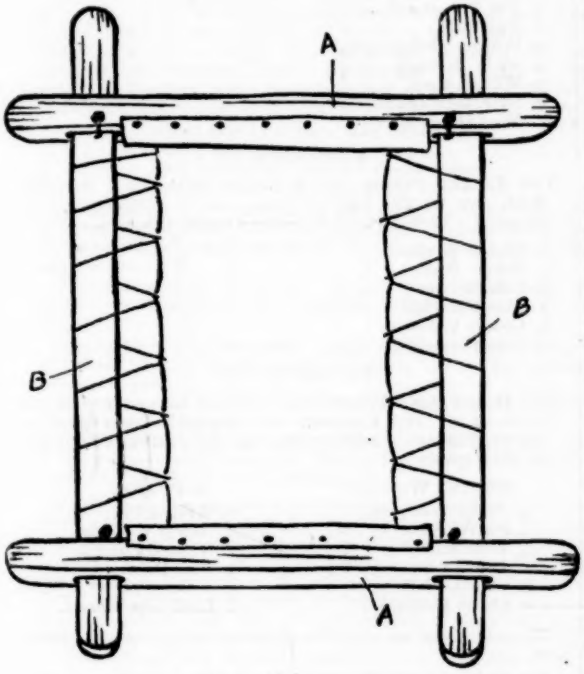
Gold and Silver Thread.—I have mentioned enough about gold and silver thread in a former paper to intimate that its use requires a special knowledge and dexterity, as it is difficult to handle, owing to its want of flexibility. For all practical purposes there are two kinds of thread now in general use, (1) paper-gold and (2) tinsel-gold. (1.) The paper-gold, which comes to us principally, if not entirely, from Japan, and which is a great favourite now, consists of gilded strips of very fine tough paper such as the Japanese have the great art of making, wound round a silken thread. It does not tarnish, which is, of course, a great advantage. (2.) Tinsel-gold is very much more brilliant than the former, and is produced by the metal being *wire-drawn* into a fine thread, which is also wound round coloured silk. Being really silver, gilded more or less thickly, it tarnishes readily in proportion to the quality of the gilding, which determines the value of the thread produced. Otherwise, it is pleasant to use, and is a good firm material for solid work, with its brilliance a little softened with appropriate colours. I give its technical name, not knowing how else to call it; but the word 'tinsel' gives a false impression of the quality of this beautiful material, which must by no means be classed among the tin-foil splendours which delight our eyes at the pantomime on Boxing Night. However, much beautiful and fine work can be done with the paper-gold, and the ancient form of it, namely, gilded *vellum*, very thin and finely cut into strips, and wound round a thread, was universally used in the most flourishing times of the arts of figured stuff-weaving and embroidery. This and the flat-beaten gold, forming a sort of gold ribbon, were certainly the forms of gold most used in ancient times; but 'it were enquiring too curiously' to enter here into the history of the use of gold and silver in textiles and embroideries, although it is so interesting a subject of research that one is almost tempted to do so. The first development of wire-drawn gold would certainly be from the delicate manipulation of flat gold ribbon, rolling it with the hand into a fragile wire, a lengthy and difficult operation, but surprisingly finely done in the earliest times when machinery was not. For, indeed, though people talk about the wonders of machinery, the patience and dexterity of man's handiwork without the help of any machine is far more wonderful.

I must repeat that gold and silver are usually treated in some firm and stiff manner in various couching stitches. It is at once the most effective and the easiest way of using these beautiful materials, but skilful workers will introduce gold into lighter needlework, threading and passing it back and forth like a thread of silk. Gold and silver so treated can be seen in the muslin towels and cloths that come over here from India, and from Turkey and Bulgaria. The gold is passed through the thin stuff, of sometimes gossamer texture, with wonderful smoothness and precision, and in its way, nothing daintier can be imagined than this rich and heavy decoration shining among the floating folds of a light and delicate muslin.

In couched gold the metal is usually threaded in a large-eyed needle, and occasionally passed through the ground, but it has to be very carefully laid down with

minute stitches of fine silk of different colours. The reader can refer to what I have written about *couching*, which equally applies to gold-work when used in this way; though, indeed, with all the difference between a pliable and a stubborn material. I should always advise learners ambitious of excelling herein to get some special instruction in gold and silver needlework, as a little teaching by word of mouth would soon dispel difficulties that appear to be very discouraging at first.

The Frame.—Most people are familiar with the aspect of an embroidery-frame, or have some idea of what it is like. It consists of two 'beams' or rollers (A) on which the textile is wound, or to which it is merely attached by a piece of stout webbing nailed to the wood, and two cross-sticks (B) which complete the frame and do the stretching, tranversely by threads



passed through the material to be worked on, and lengthways by means of pegs or screws in the beams. This is the ancient loom, simple and primitive and coeval with any sort of textile first woven by the sons of Adam: two upright posts stuck in the ground, and a beam above to hold the warp-threads, and weights below to keep all tight, or a second beam to hold the finished web. Instead of working the needle in and out of the woven stuff, the weaver works his shuttle in and out of the warp-threads, or when the simple machine is a little elaborated, shoots the shuttle between the two sets of threads, which are kept apart by a simple contrivance. The old hand-loom can be seen figured in many of the mediæval manuscripts where ladies are drawn carding, spinning, weaving, and embroidery, sitting in pretty gardens, the blue sky overhead, with ornaments on their heads, and graceful gowns on their bodies—a different picture from that presented by our latter-day weaving-sheds, where every hour spent in the hot, exhausted air among the clatter and crash of machinery is an undeserved penance to the work-girls.

Our embroidery-frame is either supported on a table or against a chair; or, which is far more convenient, is set in a stand on the ground, an arrangement which steadies the work, and leaves both hands free to ply the needle. In preparing and stretching framework great neatness and precision should be observed from the outset. The first little piece of carelessness is demoralising and leads to more; and, indeed, mistakes and disasters to the work may arise from not straining it carefully in the frame, quite straight and 'shipshape,' the raw edges cut even, and hemmed or sewn to a stout tape, through which to pass the strings that are used to stretch the work. Everything must be kept very clean (it is impossible to be too particular in this respect), and a thin, cheap lining muslin should be procured to sew over the parts of the work which are finished or not yet started on. The learner will soon notice that if she gets into a careful, precise method from the first, the difficulties of working will the more readily be minimised. Silks, too, must be carefully kept, the different shades of one colour arranged together, the colours being *labelled* for working at night, until the worker is well practised in recognising the different shades by artificial light. Gold and silver, too, should be kept from the light as much as possible, and should be cut off in lengths not overlong, as the metal thread easily spoils and breaks. Floss-silk will want much nicety in keeping, as well as in handling, for it gets rough in a little while, not being twisted, or only very slightly. Of such silks none should be left lying about but what is needed for present use, which must be wound neatly on cards, if not on nice little ivory or mother-of-pearl winders, which are certainly a luxury, but good to have, as they are smooth and clean, and keep the silk fresh. These observations are not so trivial as perhaps they seem, and all tend towards the one general axiom, 'Cleanliness and neatness,' without which your work will be naught. I have sometimes seen work, which was allowed to lie about the room between-whiles, gathering all the impurities of smoke and dust. The general dimness of aspect of such work can be imagined, and shows in itself bad workmanship. True talent, like true genius, is *never* slovenly; for the acquiring of this quality of order and care, on which I lay so much stress, is part of the apprenticeship that every worker with hand and eye must go through, be it in workshop or studio, or labouring alone and self-taught, towards excellence in any art.

A few words more about setting to work before we pass on to consider design and the nature of materials used in embroidery. I have said elsewhere that, in arranging and starting a piece of work, you must consider whether the stitches employed will necessitate the use of a frame, and also what stitches will look well in unison. Some stitches are more quickly and better done in the hand; and as it is certainly tiring to sit a long while bending over a frame, even to those who are used to it, it is well to avoid the use of one for work that can be done otherwise. For instance, satin stitch is often worked in a frame; but when worked on ordinary materials, that are not very fine or likely to pucker, it is equally well done, and much more quickly, without stretching. For darning, and for chain-stitch and other looped stitches, I consider a frame out of the question. When chain-stitch is

worked on a stretched material it is done with a hooked needle, and called *tambour* work. Tapestry, long and short, and feather-stitches are practically all stitches for the frame; as also, it goes almost without saying, are couching, appliqué, and similar methods of work. The rough division of stitches into *frame-work* and *non-frame-work* is a kind of guide as to what stitches to use together. But the learner will do well to avoid a heterogeneous mixture of stitches, and had best confine herself to the use of one or two. Variety and effect are more honestly produced by good design and careful colouring than by the skilfullest admixture of stitches.

(*To be continued.*)

A YEAR'S HISTORY TEACHING.

BY H. LUCAS.

St. Thomas' School, Huddersfield.

ALL elementary teachers welcomed the introduction of the New Code. English was no longer compulsory, and many new subjects were set forth, giving teachers a goodly number to choose from, according to their various tastes.

In our school, we determined to drop English, and take history as a class subject in its place. The appended scheme was drawn up, and submitted for approval to Her Majesty's Inspector for this district. The children took up the new study heartily, and acquitted themselves well at the annual inspection.

The scheme is as follows:—

STANDARD I.

'SIMPLE STORIES RELATING TO ENGLISH HISTORY.'

(*See New Code.*)

1. Ancient Britons.
2. Alfred.
3. Canute.
4. Richard I.
5. Gunpowder Plot.
6. Our Queen.

STANDARD II.

'SIMPLE STORIES RELATING TO ENGLISH HISTORY.'

1. Ancient Britons.
2. Alfred.
3. Canute.
4. Prince of Wales's Feathers.
5. Gunpowder Plot.
6. Royal Oak Day.
7. Lord Nelson.
8. The First Railway.
9. Our Queen.

STANDARD III.

'TWELVE STORIES FROM EARLY ENGLISH HISTORY.'

1. Ancient Britons.
2. Coming of the Romans.
3. Caractacus.
4. Boadicea.
5. Introduction of Christianity.
6. The first British Martyr.
7. The Coming of the English.
8. The Norsemen.
9. Alfred.
10. Canute.
11. Harold.
12. The Norman Conquest.

STANDARD IV.

'TWENTY STORIES AND BIOGRAPHIES FROM 1066 TO 1485, A.D.'

1. The Norman Conquest.
2. William the Conqueror.
3. Hereward the Wake.
4. William Rufus.
5. Henry I. (Beauclerc.)
6. Stephen.
7. Life among the Normans.
8. Thomas a' Becket.
9. Richard I. and the Crusades.
10. John and Magna Charta.
11. Prince Arthur.
12. Black Prince.
13. Wat Tyler.
14. Earl Simon de Montfort.
15. Conquest of Wales.
16. Battle of Bannockburn.
17. Richard Whittington.
18. Joan of Arc.
19. The Princes in the Tower.
20. Caxton (the printer).

STANDARD V.

'THE TUDOR PERIOD, WITH BIOGRAPHIES OF LEADING PERSONS.'

1. The Protector Somerset.
2. Elizabeth.
3. William Shakespeare.
4. Sir W. Raleigh.
5. William Cecil.
6. Sir Francis Drake.
7. Mary Queen of Scots.

STANDARD VI.

'THE STUART PERIOD, WITH SPECIAL REFERENCE TO CIVIL WAR, AND TO THE CONSTITUTION AND FUNCTIONS OF PARLIAMENT. BIOGRAPHIES OF SIX LEADING PERSONS.'

1. Earl of Strafford.
2. Robert Blake.
3. John Milton.
4. John Churchill.
5. George Villiers.
6. John Hampden.

STANDARD VII.

'THE HANOVERIAN PERIOD, WITH SPECIAL REFERENCE TO THE GROWTH OF THE COLONIES AND FOREIGN POSSESSIONS OF GREAT BRITAIN. BIOGRAPHIES OF SIX EMINENT WRITERS OR STATESMEN.

EMINENT WRITERS.	STATESMEN.
1. Alfred Tennyson.	1. William Pitt.
2. Sir W. Scott.	2. George Canning.
3. Lord Macaulay.	3. Richard Cobden.
4. Lord Lytton.	4. Lord Palmerston.
5. Charles Dickens.	5. Robert Peel.
6. Oliver Goldsmith.	6. Lord John Russell.

Note.—One year we take the eminent writers, and next the statesmen.

The work of Standards I., II., III., and IV., requires no special notice. The subject matter can be found in any good History. In Standards V., VI., and VII., however, the personages and events call for a vast amount of research before the teacher becomes master of the subject. We found the reading of historical novels very beneficial. Our Standard V. were delighted with 'Westward Ho!' and 'Kenilworth,' and received much useful information from them.

The following notes are a *resumé* of the lives of the distinguished persons of the various periods. They merely give important facts, and can be enlarged upon by the teacher from his own reading.

WILLIAM SHAKESPEARE, the third son of John and Mary Shakespeare, was born at Stratford-on-Avon on Sunday, April 23rd, 1564. His father was a respectable glover and farmer, who, though he could not write his own name, became High Bailiff of Stratford, and an alderman. The poet's mother, Mary Arden, was the daughter of a Warwickshire squire, and brought some landed property to her husband. Shakespeare was educated at the Free Grammar School at Stratford. Here he learned, according to Ben Jonson, 'Small Latin and less Greek'; but he really seems to have acquired a very fair knowledge of Latin, for he used, with great precision of meaning, English words derived from classic roots, *e.g.*, he calls the banks of rivers 'continents,' and he gives the word 'quantity' its proper meaning, viz., 'value.' He also seems to have learned something of French and probably Italian.

When Shakespeare was about fourteen, his father fell into pecuniary embarrassments and had to withdraw his son from school, to

earn his own living—in what calling is uncertain. At the age of nineteen he married Ann Hathaway. Whether the union was a happy one or not we have no means of judging.

A story is told by Rowe, the poet's first biographer, which, if true, which is doubtful, would account for his hasty departure from Stratford to seek his fortune in London. Rowe tells us that Shakespeare got into bad company, and was prosecuted for deer stealing by his great neighbour, Sir T. Lucy. Some colour is given to Rowe's story by the well-known satiric reference to Lucy as Justice Shallow in 'The Merry Wives of Windsor,' Act I.

Passing over the apocryphal accounts of Shakespeare's early life in London, we find him, in 1593, dedicating his first work, the 'Venus and Adonis,' to his patron, the Earl of Southampton. In the same year we hear of him as a player in 'Burbage's Company.' Meanwhile, he must somehow have been prosperous, for, in 1597, he purchased 'New Place,' a very good residence in his native town, and published 'Richard II.,' 'Richard III.,' and 'Romeo and Juliet.'

Shakespeare, about 1611, having acquired fame and money, returned to Stratford, and settled down in his comfortable home. Here he died April 23rd, 1616. Ward, vicar of Stratford some fifty years later, wrote as follows:—'Shakespeare, Drayton, and Ben Jonson had a merrie meeting, and, it seems, drank too hard, for Shakespeare died of fever then contracted.' Whether this be history or myth we cannot assert. Shakespeare was buried in the church at Stratford, where there is a bust of him—very lifelike, probably. The inscription on his memorial slab is well known:—

'Good friend, for Jesus' sake forbear
To dig the dust enclosed here.
Blest be the man that spares these stones,
And curs't be he that moves my bones.'

Shakespeare's only son, Hamnet, died before his father, who left two married daughters. The last descendant of Shakespeare was his grand-daughter, who married Sir Jno. Barnard, and died in the reign of Charles II.

Shakespeare wrote thirty-seven original plays, which may be divided into three classes, viz., Comedies, Tragedies, and Historical Plays.

Among his principal Comedies may be mentioned 'The Merchant of Venice,' 'Twelfth Night,' 'As You Like It,' and a 'Midsummer Night's Dream.'

The most notable of his tragedies are 'King Lear,' 'Hamlet,' 'Othello,' and 'Macbeth.'

The Historical Plays—some of which might come under the head of Tragedies—are 'Richard III.' 'Henry V.,' 'Henry VIII.,' 'King John,' 'Julius Cæsar,' and 'Coriolanus.'

EDWARD SEYMOUR, Duke of Somerset, was brother of Henry VIII.'s third wife, Jane Seymour, and uncle of Edward VI. He was the son of Sir Jno. Seymour, a Wiltshire Knight. On the marriage of his sister to Henry, Seymour was created Viscount Beauchamp, and in 1537, on the birth of Edward VI., Earl of Hertford. In 1547, Seymour became the foremost man in England, and had unbounded power. He was made governor of the young king, and Protector of England. The following year he was created Duke of Somerset and Earl Marshal. Somerset's first object was to carry out the wish of the late king regarding the marriage of Edward and Mary, the young Queen of Scots. He invaded Scotland, and defeated the Scots at Pinkie, near Edinburgh, 1547. He did not, however, attain his object, and Mary was sent to France, and afterwards betrothed to the Dauphin. The Protector now became alarmed by the ambitious aims of his brother, Admiral Seymour. He had married Catherine Parr, the late King's widow, and on her death sought the hand of the Princess Elizabeth. The Admiral was attainted, not being allowed a defence, and was beheaded on Tower Hill, 1549.

JOHN DUDLEY, Earl of Warwick, afterwards Duke of Northumberland, was Somerset's rival, and he sought his ruin. The Protector was unpopular, partly owing to the grand style in which he lived, and partly owing to his having put his brother to death. The nobles—at Warwick's instigation—refused to obey him, and Somerset was sent to the Tower, but was afterwards released. Warwick now became Protector, and Somerset was arrested and tried for high treason. He was tried in Westminster Hall, condemned, and beheaded on Tower Hill, before a sympathetic public, January 22nd, 1552.

SIR WALTER RALEIGH (1552-1618) 'a Devonshire worthy,' was born at Hayes Farm in Devonshire, 1552. He was a man of many parts, and shone as a soldier, an admiral, explorer, coloniser, and as a poet and prose writer. He was educated at Oriel College, Oxford. At seventeen he took the side of the Huguenots, and spent five years in fighting in France and the Netherlands. In 1576 he served in Ireland, under Lord Grey, when Desmond was in arms against the Queen. Some years afterwards (1581) Raleigh was introduced to Elizabeth by the Earl of Leicester, and for six years he was chief favourite at Court, and was knighted.

Raleigh now took to exploration along with his half-brother, Sir Humphrey Gilbert, who was twelve years his senior. They explored the coast of Carolina, and in 1585 settled Virginia, and named it in honour of the Virgin Queen. The result of this voyage was the introduction of tobacco and the potato plant.

In the great struggle against the Armada, Raleigh took a leading part, both in council and in fighting. Soon after (1589) Raleigh lost favour at Court, Essex taking his place. Leaving Court, he visited his Irish estates in Munster, and here met Edmund Spenser, whom he introduced to the Queen.

Raleigh's ambition was to found an English colony. Consequently he sold his Virginian rights to London merchants, and sailed for Manoa in Guinea. In 1595 he sailed 400 miles up the Orinoco, and published an account of his voyage.

The following year saw him again fighting the Spaniards under Admiral Howard, when they destroyed the Spanish Fleet in Cadiz Harbour.

On the accession of James I. he was the foremost man in England. On a charge of attempting to subvert the Government, and kill the king, Raleigh was imprisoned for twelve years. During this time he wrote his 'History of the World.' On offering to conduct an expedition to Guinea he was released in 1616. Though he defeated the Spaniards and burnt the town, he did not find the expected gold mine. His eldest son was killed in the attack, and Raleigh returned to England broken-hearted. In 1618 he was beheaded on the old charge of treason.

WILLIAM CECIL, Lord Burleigh, (1520–1598) was the son of Richard Cecil, of Burleigh, Northamptonshire, and was born at Bourne, in Lincolnshire, 1520. After being educated at the Grammar Schools at Grantham and Stamford, he was sent to St. John's College, Cambridge, and he afterwards studied law at Gray's Inn. His first wife was a sister of Sir John Cheke, a Cambridge professor of Greek. On her death he married the daughter of Sir Anthony Cooke.

He saw some service under Henry VIII.; but in the next reign he rose rapidly, was knighted, and became a Privy Councillor. During Mary's reign he held no office; but during the following reign he showed his ability as a Minister of State. In all the important acts of Elizabeth's reign she followed the advice of Cecil. He was raised to the peerage in 1571 as Lord Burleigh, and was made Lord High Treasurer.

He was doubtless the cause of the death of Mary Queen of Scots, thinking it best for the nation.

Burleigh was the ablest and most faithful servant a Sovereign ever had. He died in his seventy-eighth year, and was succeeded, as Elizabeth's adviser, by his son Robert, afterwards Earl of Salisbury, and from him is descended the present Marquis of Salisbury.

SIR FRANCIS DRAKE (1546–1596), another 'Devonshire worthy,' was born at Tavistock, 1546. His early life was spent on a coasting ship, trading between England and France. At twenty he sailed for Guinea, along with his kinsman Sir John Hawkins, to share in the gains of the slave trade. From Guinea they sailed to the West Indies, to dispose of their living cargo. The Spaniards attacked them in the Gulf of Mexico, and destroyed all their ships but two. From this time he showed his undying hatred to the Spaniards. He afterwards made two successful voyages to the West Indies, and, in 1572, crossed the Isthmus of Panama with eighteen men, and saw the Pacific, on which he determined to sail at some future time.

From 1577–80 he sailed round the world, plundering Spanish settlements wherever he came upon them, and had many wonderful adventures. For this voyage he was knighted. In 1587 he entered Cadiz Harbour, burnt the shipping—'singeing the King of Spain's beard,' as he called it—and in the next year served with distinction against the Armada.

Drake made his last voyage in 1575, along with Sir John Hawkins. The latter died at Porto Rico, and Drake succumbed to fever a month later at Porto Bella. Both were buried at sea.

MARY QUEEN OF SCOTS (1542-1587) was born at Linlithgow Palace, 1542. Her father, James V., died broken-hearted after his army had been defeated at Solway Moss, leaving his daughter Mary only seven days old. Her mother was a Frenchwoman, sister to the Duke of Guise. Henry VIII. desired his son Edward to marry Mary, and Protector Somerset tried to force the marriage, and defeated the Scots at Pinkie.

At five years of age, Mary was sent to Paris, where she was brought up a Romanist. In 1558 she married the Dauphin of France, and at the same time claimed the English crown, styling herself Queen of France, England and Scotland. After a married life of seventeen months her husband Francis died (December, 1560),

leaving Mary a widow at eighteen. The following year she returned to Scotland, landing at Leith, eight months after her husband's death.

In 1565 Mary married her cousin, Lord Darnley, eldest son of the Earl of Lennox. Owing to her friendship with David Rizzio, and to the weakness and foolishness of her husband, the marriage was not a happy one. After Rizzio's murder at Holyrood Palace by Lords Darnley, Ruthven and others, Mary lost all love and respect for her husband. Darnley was blown up by gunpowder, 1567, at Kirk of Field, Edinburgh, and soon after Mary married his supposed murderer, Lord Bothwell, a bold wicked man. The Scottish Lords now resolved to remove Mary from the throne and make her infant son James king, with his uncle Earl Murray as Regent. She was imprisoned in Loch Leven Castle, from whence she escaped, raised an army, and was defeated by Murray at Langside near Glasgow.

She fled across the border to Carlisle, and threw herself on the mercy of Elizabeth, 1568. Elizabeth looked upon her as a dangerous rival and imprisoned her, first at Bolton Castle, Yorks, then at Tutbury in Staffordshire, and lastly at Fotheringay Castle in Northamptonshire. After eighteen years' imprisonment, Babbington's conspiracy in 1585 sealed her doom. She was tried for joining in a plot to kill Elizabeth and overthrow the Protestant Religion, and was executed at Fotheringay Castle in 1587 in her forty-fifth year.

(To be continued.)

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NEW COMPOSITION STORIES.—STANDARD V.

Suitable for 'Unseen Tests' in Reading also.

No 41.

LOSS AND GAIN.—A young lady was sitting in a tramcar in a provincial town, when a stylishly dressed man entered, who seemed desirous of attracting everybody's attention to a valuable diamond ring on one of his fingers. He soon after got out, and the young lady, on arriving at her destination, stepped out as well, and found, on putting her hand in her pocket, that her purse was gone. She, however, felt a strange article there, which, to her astonishment, turned out to be the identical ring her fellow traveller had been displaying. Examination proved that the ring was a genuine article, the value of at least £30. Fortunately for the lady, there were only two shillings in the purse which she had lost. The ring had evidently slipped off the pickpocket's finger when he was in the act of abstracting the purse.

No. 42.

STORY OF A TOMBSTONE.—Above the south portico of St. Paul's Cathedral is a figure of the phœnix (a bird famed in fable), and the Latin motto 'Resurgam' ('I shall rise again'). The story goes, that after the size and position of the vast dome had been marked out, a labourer was told to bring a stone—to be used as a guide to the masons—from the rubbish of the old cathedral that had perished in the Great Fire of London. It happened that the stone that the man fetched was a bit of a tombstone, with nothing of the inscription left but the word 'Resurgam' in large letters. The incident being regarded as of happy omen, this word was adopted as a motto for Sir Christopher Wren's noble building. The phœnix was a bird that was said to live for five hundred years, and then to burn itself to ashes, out of which it came with renewed life for another period of five centuries. In choosing this bird, allusion was intended to the new cathedral rising out of the ashes of the old.

No. 43.

STORY OF A PARROT.—A parrot was the property of a gentleman, who was very fond of pickled cockles. One day it stole some which were standing in the kitchen, and the cook in a rage splashed some hot water over it. The poor bird's head was so much scalded that all the feathers dropped off, and for a long time she seemed very dejected. Her cage was placed in the drawing-room, and her mistress tried every means to rouse Polly to her former lively condition, but failed in doing so, until one day a visitor was announced, and an old gentleman, whose head was perfectly bald, was ushered in. The moment the stranger entered the room, Polly sprang into the ring suspended in her cage, swung herself violently to and fro, and exclaimed, 'Ha! You've been at the pickled cockles, have you?' From that time she quite recovered her spirits, the discovery of one whom she regarded as a fellow sufferer having apparently reconciled her to her own denuded condition.

No. 44.

THE TOAD AND THE FLIES.—A somewhat comical story is told of the sly trick that a toad used to play in order to entice flies to come near him. He had noticed that the sodden meal left in a saucer by the chickens in a farmyard attracted swarms of flies; and he laid his plans accordingly. Every night he was seen to come hopping up to the saucer to jump into it, and then to roll himself in the meal until he was fairly covered over with it. Toads don't care for meal, but they like flies. Flies don't like toads, but they are fond of meal. In due course the guileless insects began to hover around the sly toad, but as soon as a fly came within reach of his tongue it was promptly gobbled up. Night after night this fly-catcher was busy at his trade, which seems to show that he was an unusually clever toad.

No. 45.

THE CLEVER CROWS AND THE DOG'S BONE.—One afternoon a dog was lazily enjoying a bone on the lawn of a house in Burmah when a number of crows perched near him. First they set their black heads on one side and then on the other of their glossy shoulders, eyeing the bone with envious looks. It was plain they meant to get it—honestly, if they could, of course. Two of the band hopped pretty near the dog, but his growls warned them to take no liberties. So they retired to their mates, and all seemed to be talking over the matter once more. A new plan of campaign was speedily arranged, and presently a crow managed to fly near the dog unseen, and seized his tail in his strong beak. With a yelp of pain the dog turned round to punish the rascal, but in that moment his bone was snatched up and carried aloft to the trees. The dog lifted his head and howled, but the crows only said 'Caw! caw! caw!'

No. 46.

ONLY A CABIN-BOY.—A big battle was being fought between the English and Dutch navies. Soon after it began, and in spite of the greatest care and the most splendid bravery, the admiral saw that the English sailors must be beaten unless he could get help. There were a few ships some distance off to the right, but they were to act as a reserve and would not enter into the battle without a message from him. The admiral stood a moment and wondered how that message could be sent. It was not possible to signal, there was only one way—the message must be carried. So he wrote his order, telling the captain of the reserve to come and help him at once. Then he called for anyone who was willing to be the messenger. All around there rained a heavy shower of bullets. To swim to the ship, with the chance of being shot every second, was terrible. Yet many of the sailors came forward, including one of the cabin boys. 'What can you do, my fearless lad?' said the admiral kindly. 'I can swim, sir; and if I am shot I shall be missed less than anyone else.' The paper was handed to the boy, who put it between his teeth and sprang overboard. He reached the reserve ships in safety, and the victory was gained by the English.

No. 47.

MR. BARNUM AND THE INVALID BOY.—Mr. Barnum, the famous showman, has always been very fond of children. Once, he paid a visit to a friend, and he found out that a little five-year-old boy in the house was greatly grieved because he would not be able to see the show on account of his illness. 'Well,' said Mr. Barnum, 'if you cannot go to the show, we must bring the show to you,' and in the course of an hour a procession of elephants, camels, and dromedaries entered the courtyard of the house, and halted in front of the room where the little invalid lay. The boy was brought to the window, and the keeper of the animals then made them go through their performance. Not only so, but the child was asked to bid the elephants do whatever he wished them, and at a sign from the keeper the big wise creatures all obeyed the invalid boy's orders. In half an hour the show was over, and the procession returned to its proper quarters. The little boy was immensely delighted, and did not soon forget Mr. Barnum's kindness.

No. 48.

HOW THE CLOCK WENT WRONG.—An old-fashioned 'grandfather's clock' suddenly kept very bad time, and was sent to a jeweller's to be repaired. On taking out the works it was found that a mouse had built a nest of straw and carpet strips on the top of one of the wheels, and that this was the cause of the clock's strange conduct. The mouse had got into the clock by gnawing a hole in the back,

and although the hours were regularly sounded and the works went on after a fashion, the noise had not prevented her making her nest in such unlikely quarters. The mouse, of course, was gone, but she left behind her four wee babies, which the jeweller was, oddly enough, able to befriend. For he had a guinea pig that had just lost her young ones, and when he put the little mice into her box she at once adopted them as if they had been her own, and nursed them. The small mice grew larger and larger, until one day they jumped out of the box and never came back.

No. 49.

BURIED ALIVE.—Some years ago a house in the High Street of Edinburgh, 250 years old, suddenly fell in, and 36 persons were crushed to death. Plenty of willing hands were soon at work to rescue the wounded, one of whom—a young lad—had a marvellous escape. The oak beams supporting one of the floors had not quite given way, and acted as a shield against the stones and rubbish Thus sheltered, though severely crushed by the planks and rubbish, the boy heard the men who were busily removing the mass of ruins from the poor folk buried beneath them. As they drew near him he roused them to fresh efforts by shouting cheerily, 'Heave away, lads, I'm not dead yet.' He was soon rescued from his perilous position, and when the new house was built, a bust of the plucky boy was carved in the stone below the principal window, with a scroll on which were graven the words that so well showed his presence of mind.

No. 50.

KING LEOPOLD AND THE LITTLE GIRL.—About eight years ago a sailor named Moore ran away from his ship. Six years passed, when he was arrested at Antwerp, and put in prison for his offence. While he was in jail a little niece of his wrote a letter to Leopold, the King of the Belgians, begging his Majesty to set her uncle free. She said that six years before her aunt was dying, and that her only prayer was that she might live long enough to see her brother. Her uncle showed the letter to the captain of the ship, and asked for leave to go and visit his sister. The captain refused permission, and her uncle then deserted from the vessel. After telling the king the history of the whole matter, the little girl gravely asked, 'Your Majesty, if you had been in his place would not you have done the same?' and she ended her letter by 'hoping you will pardon my uncle for deserting, and me for writing.' You may be sure the little girl was overjoyed when she received a letter from a government official, stating that her uncle had been released by command of the king, 'out of compliment to his Majesty's little friend.'

No. 51.

'FOR HER BROTHER'S SAKE.'—Two little children were left alone in the world by the death of their parents. One was a girl of eleven, the other, a boy of four. When the little girl was left alone she made up her mind to be a mother to her little brother. Some kind neighbours offered to adopt the children, but the little girl knew that all the villagers were too poor to take more than one child into their family, and she could not bear to be separated from her little brother. So she refused the kind offers, and for three whole years she kept him, working hard at spinning and knitting to earn the money. Then there came a terrible winter. The frost was so severe, and lasted so long that the wolves left the forest, and came prowling round the village for food. One sad day, the little girl had been baking. The bread was lying on the table to cool, and smelt so nice, that a hungry wolf burst into the cottage, followed by her three whelps. The little girl was brave as well as loving. With a heavy stick she faced the big wolf, and had almost driven it to the door, when she saw one of the whelps going towards her brother, who was small enough for them to attack. She dropped her stick, seized the boy, and pushing him into a cupboard, fastened the door on him. But that brave deed cost the faithful girl her life. The big wolf sprang at her throat, and she died a martyr for her brother's sake.

No. 52.

STORY OF COLSTON'S SCHOOL, BRISTOL.—There is at Bristol, a charitable institution called 'Colston's School,' from the name of its founder. The scholars wear on their breasts the figure of a dolphin in brass, the reason of which is as follows:—Mr. Colston, a rich West India merchant, was coming home with a ship which contained all his treasure. She sprung a leak, and after having pumped for a long time, day and night, the people on board were every moment expecting to go to the bottom. At once, to their great astonishment, the leak was stopped. On examination, it was found that a dolphin had providentially squeezed itself into the hole, and thus saved them from destruction. Mr. Colston therefore ordered this emblem of a dolphin to be worn, as a signal both of his deliverance and gratitude.

No. 53.

A HAPPY BIRTHDAY.—A little girl sat in the window of a large house, holding in her hand five bright new shillings. Her name was Lily, and she was eight years old that day. She was waiting for her mother to take her to spend the money. They went and looked at the shops, but the toys that Lily wanted were far too expensive. At last she chose a very pretty doll, for which she gave all her money except sixpence. On going out of the shop a sad sight met their eyes, for there stood a poor little beggar girl. She looked very sad, hungry, and miserable. Lily had a kind heart and she whispered to her mother, who nodded and looked very pleased. Lily asked the little girl's address and name, and after giving her the remaining sixpence, told her they would call and see her. When the child had gone, Lily and her mother went into the shop again and asked the lady to change the doll, and give them back the money, which she readily did. On their way home, they bought tea, bread, butter, and a few other things. When they got home a cake was packed into a basket with the things they had bought, and then they went to find out the poor girl's home. They found the family in great distress, but the contents of the basket relieved their immediate wants. And Lily spent a very happy birthday in consequence.

No. 54.

THE SHOPKEEPER'S APPRENTICE.—A boy went from a retired country village to be apprenticed to a shopkeeper in a large city. The shop was in a street leading to the principal churchyard. Not having formerly seen a funeral above once in a year or two, he was alarmed to witness two or three pass the shop the first day he was there; still more, by observing as many the second day; and finding not fewer on the third, he resolved to remain no longer in what he conceived to be so dangerous a place. By sunrise on the fourth morning he packed up his little bundle of clothes, and having escaped by the window of his chamber, he fled home in great haste to his mother. Being surprised at this unexpected visit, she naturally inquired into the cause of his return. 'Mother,' said he, 'a person is not sure of his life for a minute in that town, for they are burying the people as fast as they can.'

No. 55.

BLACK BOB.—Sir Robert Gillespie who led the attack on one of the Indian fortresses in 1814, but who was shot through the heart in the attempt, left behind him a horse of rare beauty, known as Black Bob, from the colour of its hide. The animal was put up for sale, and the men of Sir Robert's old regiment wished to purchase him. Unfortunately, the price of 300 guineas had been put upon him, and this soon increased to 400. Not to be beaten, however, the troopers of the 8th Light Dragoons subscribed the amount, and the horse became their property. He soon became the pet of the regiment, and whenever the men changed their quarters, he always marched riderless at their head. Eight years later the regiment, being under orders to return to Europe, were dismounted and their horses turned over to the 16th Lancers, so they were compelled to part with Black Bob, and he was sold to a civilian in Cawnpore. A few days after, the regiment started on foot to embark for Calcutta. As they marched along, the band played a familiar Irish quick-step, and the sounds fell on Bob's ears in his new home. He grew almost frantic, kicked his stall to pieces, and nearly strangled himself in his efforts to escape to rejoin his old comrades. After a while he got loose and galloped off to the barracks. But the excitement had been too much, for Black Bob had hardly reached the square when he fell dead—close to the saluting post.

No 56.

SAGACITY OF A DOG.—A gentleman residing in Antwerp wished to get rid of a spaniel, and gave it to an intended emigrant to take with him to America. Two months later the owner of the dog was on the quay, attending to some business there, when the American steamer arrived. What was his astonishment to see the faithful animal, which he believed thousands of miles away, upon perceiving its master, jump overboard, and, after a swim of five minutes, scramble up the steps and testify with the most intense satisfaction his joy at finding him once more. 'Tom' must either have hidden himself on board the steamer, or watched until it was about to sail, in order to get back to his master, who, it is hoped, will appreciate his sagacity.

No. 57.

A LIFE'S SACRIFICE.—The terrible words Fire! Fire! rang out on the night air, and an excited crowd rushed up to a handsome

house which was in flames. 'Thank Heaven there is no one in there!' said one man to another. The words were hardly out of his mouth when a lady sprang forward crying: 'My child! my child! she has been forgotten; will nobody try to save her?' No one stirred. 'It would only be the sacrifice of one life for another,' said one man. Before he could say another word, a boy started from the crowd and stood before the lady. 'Let me try, please, let me try?' he cried eagerly. He was only a little Italian beggar, but there was more true bravery in his heart than in that of any man in the crowd. A ladder was fetched, and a long coil of rope was given to the boy. He slung it over his arm and then commenced quickly, but carefully, to climb. At last he reached the window, only just in time, for, as he clambered over the window sill, the flames caught the ladder; it burnt and fell with a crash. It seemed an age before the boy reappeared at the window, holding in his arms a baby girl, which he lowered by means of the rope. Then the flames leaped in at the window, and the crowd saw the boy fling up his arms and fall back. His body was afterwards found, but lifeless. It was truly but the sacrifice of one life for another; but what could be nobler?

No. 58.

THE LADY AND THE COACHMAN.—A lady wanted a coachman, and advertised the situation. Several called to see her about the place, and in answer to her inquiries the first applicant said: 'Yes, madam, you could not have a better coachman than myself.' She replied: 'How near do you think you could drive to danger without an accident?' 'Madam, I could go within a yard of it, and yet you would be perfectly safe.' 'Very well, you will not suit me.' The second one had heard the question upon which the first one had been rejected, and therefore he was ready with his answer:—'Danger, madam! why I could drive within a hair's breadth, and yet be perfectly safe.' 'Then you will not suit me at all.' When the third came in, he was asked: 'Are you a good driver?' 'Well,' he replied, 'I am careful, and have never met with an accident.' 'But how near to danger do you think you could drive?' "Madam,' he said, 'that is a thing I never tried; I always drive as far from danger as ever I can.' The lady at once replied: 'You are the kind of coachman I want, and I will engage you at once.'

No. 59.

FILIAL AFFECTION.—The danger occasioned by an awful eruption of Mount Vesuvius obliged the inhabitants of the adjacent country to flee in every direction for safety. Amidst the hurry and confusion, everyone carrying away whatever he deemed most precious, two sons, in the height of their solicitude for the preservation of their wealth and goods, recollected their father and mother, who, being very old, were unable to save themselves by flight. Filial tenderness overcame every consideration. 'Where,' exclaimed the generous youths, 'shall we find a more precious treasure than our parents?' This said, the one took up his father on his shoulders, the other his mother, and so made their way through the surrounding smoke and flames.

No. 60.

REWARD FOR HONESTY.—A gentleman travelling in Scotland was asked for alms in the High Street of Edinburgh by a little ragged boy. He said he had no change, upon which the boy offered to procure it. The gentleman, in order to get rid of him, gave him a piece of silver, which the boy conceiving was to be changed, ran off for the purpose. On his return, not finding his benefactor, whom he expected would have waited, he watched for several days in the place where he had received the money, pursuing his occupation. At length the gentleman happened again to pass that way, when the boy accosted him, and put the change into his hand, counting it with great exactness. The gentleman was so pleased with the boy's honesty, that he placed him at school, with the intention of providing for his future advancement in life.

NEW DICTATION TESTS.

Suitable for 'Unseen Tests' in Reading also.

STANDARD IV.

No. 33.

The use of spoons as gifts from god-parents to god-children dates back nearly five hundred years. When the giver was too poor to present the whole twelve, he gave one spoon with the image of the patron saint after whom the child was named, or to whom he was dedicated, or who was the patron saint of the donor, not always in such cases an apostle. The images of the four Evangelists were often thus used, the spoons being called 'apostle spoons,' although all were not apostles in the usual meaning of the word.

No. 34.

When just emerged, a butterfly looks but a sorry object, and as little adapted for flying as it was while in the caterpillar state. It possesses wings, it is true—not such as we are accustomed to see later on, but wings that are small, shrivelled objects, out of all proportion to the body of the insect. They gradually unfold and develop, however, until in the course of an hour or two they have attained their proper size, and then, for the first time, the little creature is able to leave the earth, and soar aloft.

No. 35.

Four schoolboys, the eldest twelve years of age, who had been sliding on a pond, on Friday afternoon, lost their way in a fog and wandered about the woods until they were exhausted. Search parties were organised in the town, and about midnight the missing lads were found huddled together asleep under the shelter of a hedge. The little fellows were exhausted and benumbed with cold.

No. 36.

A gentleman writes thus: About a month ago I put some water out for the birds on a very cold day, thinking they looked thirsty, and, to my surprise, there was a regular scramble for it, and it was wonderful to see how they enjoyed their bath, although a keen north-east wind was blowing, and it was freezing hard. Since then I have always kept water for the birds in a pan in the garden, and they seem to look for it more anxiously than for the food. Please allow me through the columns of *The Standard* to ask others to give the birds a bath, and they will find their trouble well repaid.

No. 37.

In some parts of America it is usual among the natives to greet strangers by crowning them with wreaths made of leaves and small boughs. By these, they mean to convey the idea that their intentions are peaceable and friendly. Several parts of the world are inhabited by people who salute one another by rubbing their noses together. Not a very pleasant sort of greeting according to our ideas, but one which, no doubt, seems just as nice to those who practise it, as kissing does to us.

No. 38.

The butcher's block has undergone a remarkable change. Not only are large and perfect tree stumps of hard wood more and more difficult to obtain, but even the best of them crack and split most unaccountably. The modern first-class chopping block has therefore become a square mass made up of cubes of carefully selected wood bolted and then cross-bolted together, after being so arranged that the chopping upon them will be done on top instead of with or against the grain. These blocks are very costly, but they last a long while.

No. 39.

I have seen a toad attempt to swallow a huge caterpillar, and I have even known one to undertake a wounded humming-bird. In this case the attempt was a perfect failure. But when a toad has transferred the head of a large locust to his stomach, and finds the hind legs and tail still protruding from his mouth, he usually turns to the nearest stone or fence, and pushes the grasshopper's legs against the obstacle until he has rammed them into his mouth.

No. 40.

The Crown Prince of Japan, who is now in his 12th year, is a very diligent scholar. At the yearly inspection of the school authorities who have the superintendence of the children of the nobility he received the following certificate: 'His Highness the Crown Prince of Japan during the past year (the fourth of his yearly course of elementary studies) has not missed a day in his attendance at school; and herewith receives honourable acknowledgment of the same.'

No. 41.

In the third week of every June the town of Buxton holds high holiday. The springs and fountains are decorated with boards of quaint and tasteful designs, in which flowers are lavishly used. Banners and triumphal arches adorn the streets, while bands of music enliven the town, and many old English sports are revived for the time. This period of mirthfulness is a survival of the ancient custom of dressing, once a year, the mineral wells for which Buxton is famous.

No. 42.

An excellent plan to purify air in sleeping rooms is to keep an inch or two of the window open—from the top. But in many cases

this is impracticable, and as an alternative it is wise to keep in the sleeping chamber a basin or open vessel of water. Water absorbs all the impurities of the atmosphere and keeps the air pure. Besides acting as a purifier, it will absorb large quantities of coal or illuminating gas, should any escape.

No. 43.

After being cut, the screws are hardened, and put in frames, about one hundred to the frame, heads up, this being done very rapidly by the sense of touch instead of by sight, and the heads are then polished in an automatic machine, ten thousand at a time. The plate on which the polishing is performed is covered with oil and a grinding compound, and on this the machine moves them rapidly by reversing their motion.

No. 44.

My host was a well-to-do tradesman, but instead of having a spare room for travellers in his own dwelling he kept one in a house near by. At dusk the hostess came to show me the room. It was over a stable. At the door of this she directed me to mount a ladder, saying, 'At the top you will find a small bed. Good night!' She then locked the door and took away the key. I ascended the ladder, when opposite me lay an immense bull-dog, whose duty appeared to be the care of two sacks of flour.

No. 45.

When on the slipway, the wheels sank into the faggots and soft earth, and the boat remained stationary for a long time, all efforts of the soldiers and others being unable to move her. Eventually the crew got out, and with their assistance the boat was brought down to the level of the beach. With the assistance of the soldiers, many of whom went in the water to their necks, the boat was launched. The carriage had been pulled as far into the sea as possible, and at a favourable opportunity the order was given to 'Let go.'

No. 46.

The door of the room in which the disaster occurred was locked and bolted, and the next, leading into the large class-room, was close to the platform, which had to be climbed over ere the next room could be reached. Against the platform was a door leading from the class-room to the yard, but the platform prevented this from being opened, and had one been able to get to it, it would have been found to be locked and bolted. Thus the only means of escape led over the platform, and through the school-room, amidst the stalls and decorations, to the door beyond.

No. 47.

The manager of the brewery saw the explosion occur. He says his attention was attracted to the other side of the thoroughfare by a great noise, and on looking round he saw the shop and the hotel lifted bodily up and then fall down in ruins. There were very few people about. He had noticed one man walking along the street, and there were also an omnibus and a horse and cart standing not far from the building.

No. 48.

In this way he became a clever artist. One day he tried to draw from the life, and with such success that he set up as a portrait painter. Having by the dint of labour and perseverance acquired much knowledge, he removed to London as a lecturer. His classes were very popular, and one of his pupils was the prince, who afterwards became king, as George the Third. He was his own instructor, not only in the elements of knowledge, but in sciences that require, as a rule, masters to teach them.

STANDARDS V. — VII.

No. 18.

Dean Bradley opened the proceedings, observing that he accepted the responsibility, which he felt to be a great one, of adding one more to the national memorials of Westminster Abbey. His decision might possibly have been influenced by his personal esteem for a departed and gifted friend. Upon that intimacy he had no intention of dwelling, but he felt sure that he was treading the path his illustrious predecessor would have trodden had he been spared to consider the question of giving to Matthew Arnold a place among the honoured dead in the Abbey. One of his memories was as melancholy as it was tender. It was nearly fifty-two years ago that he, in company with the late poet and four other young men, paid a visit to the poet Wordsworth. Of the six for whom life was then so pleasurable and so gay he was the only survivor.

No. 19.

It is asserted that the smallest screws in the world are those used in the production of watches. Thus, the fourth jewel wheel screw is the next thing to being invisible, and to the naked eye it looks like dust; with a glass, however, it is seen to be a small screw, with two hundred and sixty threads to the inch, and, with a very fine glass, the threads may be seen clearly. It is estimated that an ordinary lady's thimble would hold one hundred thousand of these screws. No attempt is ever made to count them, the method pursued in determining the number being to place one hundred of them on a very delicate balance, and the number of the whole amount is determined by the weight of these.

No. 20.

Another remarkable circumstance deserves notice; certain muscles and parts of the body begin to sleep before others. Sleep commences at the extremities, beginning with the feet and legs, and creeping towards the centre of nervous action. The necessity for keeping the feet warm and perfectly still, as a preliminary of sleep, is well known. From these explanations it will not appear surprising that, with one or more of the senses, and perhaps, also, one or more parts of the body, imperfectly asleep, there should be at the same time an imperfect kind of mental action, which produces the phenomenon of dreaming.

No. 21.

As public attention happens just now to be specially attracted to railway reforms and innovations, thanks to the judicious and timely step taken by the Great Northern Company, it may not be inopportune that we should take occasion to repeat certain wholesome advice which we have already more than once offered to the directors and managers of the gigantic systems of communication and transport, which, on the whole, reflect such shining credit on the industry, ingenuity, and enlightenment of their able organisers. No pains should be spared to ensure a higher average of punctuality in arrivals and departures than that which generally obtains, and which, in connection with certain important lines, has of late years achieved an unfavourable notoriety.

No. 22.

According to the most eminent writers on the subject, it has been ascertained that, in beginning to sleep, the senses do not unitedly fall into a state of slumber, but drop off one after the other. The sight ceases, in consequence of the protection of the eyelids, to receive impressions first, while all the other senses preserve their sensibility entire. The sense of taste is the next which loses its susceptibility to impressions, and then the sense of smelling. The hearing is next in order, and last of all, comes the sense of touch. Furthermore, the senses are thought to sleep with different degrees of profoundness. The sense of touch sleeps the most lightly, and it is the most easily awakened; the next easiest is the hearing; the next is the sight; and the taste and smelling awake the last.

No. 23.

The Speaker of the House of Commons, addressing his constituents last night, said the most important event of the present year had been the passing of the Technical Instruction Act. There were three dangers which appear to him to surround the distribution of what was called in the north the 'whiskey money,' for the purposes of technical instruction. There was the width of the definition, the number of applications which were made for grants, and the great difficulty of organisation. He had no doubt the various councils who were entrusted with the money would distribute it in the best possible way, but the great and serious risk was, that the sums distributed would be frittered away and deprived of those results which better organisation and a better-considered scheme of technical instruction might have produced.

No. 24.

It has been for a long time past, and still is, a subject of daily public complaint that delays on railways of from twenty to sixty minutes occur in the course of comparatively short journeys, and the companies cannot too seriously take to heart the fact that in thus breaking the promise of their time-tables they are doubly wronging clients, inasmuch as unpunctuality, protracted beyond a certain time-limit, causes alarm as well as inconvenience. It is also the origin of a large percentage of the minor accidents that rarely reach public cognisance, and might for the most part be averted by the exercise of absolute care and exactitude; and it costs far more money than need be expended to prevent it.

No. 25.

There is little probability that smuggling in this country will ever again assume the proportions attained by it in 1831, when it was estimated that the duties on French goods which were annually evaded reached the enormous amount of from eight hundred thousand to one million pounds. Since the adoption of Free Trade by these islands the coastguard has had no preventive duties to per-

form, and has been converted into an institution for defending our shores against foreign foes, for maintaining a reserve of trained sailors for employment at sea if need should arise, and for furnishing auxiliaries to lend succour to a distressed ship thrown upon the rocks and sandbanks which in many places girdle the seaboard.

No. 26.

The rising in China is said to have attained certain proportions. Two or three important towns are alleged to have been captured, and some hundreds of natives—among whom a considerable number of Christian converts—are reported to have been murdered. There is, however, no reason for believing that the lives of any Europeans have yet been sacrificed. Six thousand picked soldiers, commanded by the chief officer of the province, have been sent by the Government to suppress the rising, and the Government are confident that this will be done. The soldiers should be now near the scene of the outbreak, and should be able to deal with it. Rumours of the most sensational kind are daily circulated, and will doubtless be transmitted.

No. 27.

How different the sordid street looked in its emptiness, and bathed as it now was in the sacred dawn! Its ugliness, its drab monotony, its depressing dinginess had disappeared; the gold of morning had washed it and made it almost beautiful. The polished tram-lines gleamed in the morning glory like two lines of fire, whose converging flames were lost in the broad radiance from which the golden splendour seemed to throb forth as out of a great heart of light which was eager to empty itself. A faint luminous mist lay over the silent city, out of which dome and steeple, dingy gable and factory chimney, rose glorified like the creation of a fairy architecture.

No. 28.

The Major, addressing the students and their friends, said that it must be a source of the greatest possible gratification, not only to the directors of the Crystal Palace Company, but to the superintendents and the instructors of the school, to hear so gratifying a report of the work of the term as that which had been read. He congratulated the students who had been successful, and the instructors upon the good results produced. Those who had been successful must remember that the gain of all the certificates in the world would not insure their success as engineers. They could not succeed unless they made up their minds to study for many years to come.

No. 29.

Not for many a year have the Zoological Gardens presented on Boxing-day such a wintry scene. Snow lay everywhere around; and the trees were stripped and barren. The elephants and the camels were housed, and no merry children were carried on their customary perambulations. The visitors congregated in the lion and reptile houses, the monkey house, and other warm and cosy places. The monkeys enjoyed a larger treat than usual of nuts and cakes. The outdoor animals looked mostly pinched and unhappy. But the Polar bear was in full vigour, and evidently enjoyed the coldness of the weather, while the Lapland reindeer were also jovial in their way.

No. 30.

In a few days the authorities of the London parks will begin the annual free distribution among the working classes of the surplus bedding plants—a pleasant custom which has for many years been a feature in the management of the Royal parks, and, under the direction of the County Council, has now become general. It is a form of benevolence which injures no one, and pleases a large number. When the enormous quantity of the plants which have been standing in the parks is considered, it will be obvious that the superintendents have ample resources to draw upon, even after they have put aside enough for their own purposes.

No. 31.

When the working man had to work twelve hours a day every day in the week, he had not much time for recreation; but now the tendency was all in the direction of more holidays and shorter hours. They had got half-holidays and Bank Holidays established, and twelve hours' work had shortened to ten, then nine, and now it was claimed that eight hours should be the normal day's labour. It was a task not unworthy of a philanthropist or statesman to see that the time thus gained for recreation was spent in such a way as to keep the body and mind in perfect health, and to make the intervals of work still more fruitful.

No. 32.

The terrible disaster at Leeds, which was briefly recorded yesterday, has, we regret to learn, already resulted in the death of six of the children. The details, now that they are more fully known, are of the most painful and harrowing description. The occurrence took place in St. John's Schoolroom, where, in connection with an entertainment, a number of the younger children were to perform a piece known as 'Snow Flakes.' For this purpose they were all dressed from head to foot in white wool, each child being required to carry a lighted Chinese lantern.

No. 33.

The new Archbishop is not one of those preachers who are inclined to allow the ornaments of rhetoric to interfere with the substance of their discourses. Both his sermons and the addresses he has from time to time delivered at the meetings of Diocesan Conferences and similar bodies show a vein of strong and manly common sense. Occasionally, these utterances have given grounds for misrepresentation, but the Bishop of Peterborough cannot be numbered with those teachers who think it necessary not to speak the whole truth, lest it should provoke mistaken criticisms.

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ELEMENTARY LESSONS IN AGRICULTURE.

BY PROF. GREEN,

Examiner in Botany to the University of Cambridge.

IX.

Manures—Their Nature and Uses.

We have seen that plants absorb a very large proportion of their food from the soil, and that their roots are so placed in relation to the soil that this absorption of food is easily carried out. We have seen again that the soil contains the materials the plant uses as food in two conditions, in one of which they can be of immediate use, while the other makes it necessary for chemical change to take place before the plant can absorb them. Now it is evident that if plants are allowed to grow year after year in the same soil they must gradually use up all the available food which it contains, and so it must become less and less fit to nourish them. In such a condition of things two courses of action are open to the farmer. He can either take steps to help the transformation of the dormant food-material into the condition in which the plant can use it, or he can add to the soil the materials which the plant has already drawn from it. Both these methods are usually resorted to. Both come under the head of what is termed *manuring*, though often only the latter of the two is meant when that expression is used.

The word manure then means artificial plant-food. Such may be required in four different cases:—(i) The soil, originally fertile, may have been deprived, by successive crops, of the food material that was once there, so that it fails to repay the farmer for the expense of cultivation; (ii) the soil may be naturally too poor in food material to be worth cultivating under ordinary circumstances, and yet in consequence of increased demand for the crop it may become necessary to do the best with it that it is capable of; (iii) the soil may be deficient only in some important element which the growing plant needs, such as potassium or phosphorus; (iv) the farmer may be desirous of raising some crop which needs an unusual amount of some particular element, which therefore must be specially supplied.

Still, though we think of manure in general as being the material directly used by the plant, we must not forget that anything that helps to bring the dormant food-material of the soil into the active condition really is of very great importance, and should be properly regarded as manure. Thus some of the materials put upon the soil act by decomposing these dormant materials, converting them into soluble ones, while others alter and improve the physical character of the soil.

We will therefore examine these two classes separately, taking first the fertilisers, which bring to the plant directly the food which the soil lacks. Sometimes these are sub-divided into two classes, known as *general* and *special* manures. The first of these are those manures which restore to the soil all the food elements of which its crops have deprived it; the special manures, on the other hand, contain only some of the constituents of the plant's food. The first kind is useful in *all*, the last kind in *special* cases.

We will take the general manures first. Of these the first and most important is one which is in universal demand, and which it is one of the great objects of the farmer to prepare on the farm, viz., farmyard manure, or *dung*. This is sometimes prepared in the farmyard, and treated very carefully, as we shall see presently; sometimes it is allowed to be deposited on the land directly by the animals, as in grazing and folding. Another general manure very largely used is what is known as *green crop* manure. In this case a crop of some such plant as clover or mustard is allowed to grow to a certain extent, and is then ploughed straight into the soil. In some parts of England and Scotland, near the coast, seaweed is spread upon the soil and ploughed in. Another fertiliser which is in very great demand is an artificial manure known as *Guano*, which is used to help out the supply of farmyard manure, or in some cases is employed alone. Other materials, such as animal and vegetable refuse, are often used for the same purpose.

Of all these the farmer employs most constantly the first, the so-called *farmyard* manure. This is the most uniformly advantageous; it returns to the soil the very materials which the crops have taken from it, and as it contains thus all the elements that a plant requires in order to thrive, it is suited to all soils. It supplies, indeed, all that any soil lacks, *e.g.*, potash, magnesia, lime—it contains a good deal of straw, which supplies silica—it furnishes chlorine and iron. More than that, by the ease with which it can be spread it ensures that the matter restored to the land is very regularly distributed throughout the field. It decomposes very gradually after it has been mixed with the soil, and so yields up the food-materials it contains slowly and regularly as the plant wants them at different periods of its life. In consequence of this gradual decomposition the beneficial effect of farmyard manure is often observed for several years after it has been applied.

The preparation of this farmyard manure is one of the most important processes which the farmer has to carry out. It takes a considerable time and demands great care. The droppings from the animals are mixed with the straw or litter with which the farmyard is supplied. When a certain proportion of dung and straw has been attained, the mixture has to undergo a process of fermentation, which must be carefully carried out to a certain stage, after which it deteriorates. There is during this process a possibility of a waste of valuable substance, which must be carefully guarded against. The question of the amount of water which is allowed to mix with it is also of great importance.

In most cases the manure is made in open yards. There is in this case a danger of much of its fertilising matter being washed away by rain. To prevent loss in this way, the yard should be properly drained and the fluid that soaks out thus made to pass into a tank, from which it can be pumped out and used in the liquid condition. Sometimes the yards are roofed over to prevent the free access of rain, or the manure is transferred to covered pits. The danger in this case is that it may become too dry and over-heated, when there is often a loss of ammonia, which enters into combination with carbonic acid, and being then very volatile, it escapes into the air, involving waste. Often the manure is stacked in a large heap in the open to undergo its fermentation. If this be done, the heap should be made on a solid bottom, through which its liquid part will not soak, and it should be banked up by earthy matter to a moderate height. Farmers often cover such a manure-heap with a few inches of loose soil. In the management of the fermentation, the access of air as well as water is of considerable importance, hastening the process. When a farmer therefore wants the fermentation to be rapid he has the manure turned and laid lightly in a heap, so that the air may get at it freely. On the other hand, to retard the process, the dung must be closely packed and compressed as much as possible. The dung-heaps are generally constructed in frosty weather, when the land is too hard to plough, but is firm enough to bear the weight of horses and carts. If the dung is removed from the yards early in the year, very soon before it is wanted to be spread over the land, it is stacked loosely, so that its decomposition may be hastened.

Farmyard manure is a very complex mixture, generally very rich in nitrogen, which gives it a great part of its value. Among the materials found in it are water; soluble organic matter, which is the seat of most of the nitrogen; soluble inorganic matter, containing potash, lime, magnesia, phosphates of lime, chloride of sodium, sulphuric acid, carbonic acid, etc.; also both organic and inorganic matter which are not soluble. As fermentation proceeds a good deal of water evaporates, and certain volatile products escape, so that there is a loss of weight; but the proportion of active or soluble food material which the plant can use immediately is increased.

The farmer has to consider, in preparing his manure, what is the character of the soil on which it is to be used. A close heavy soil should have the manure put to it when the fermentation is not too far advanced, and the decomposition then takes place in the soil without waste. Such a mixture also improves the character of the soil by making it more porous. In the case, however, of soil which is light and does not contain much clay, the more thoroughly decomposed the manure the better. Such a soil is very likely to allow a good deal of waste if the manure should be put on it before it is well fermented, as the fluid part will be very likely to sink away out of the reach of the crop.

Farmyard manure is often applied to the surface of a growing crop, a mode of application known as "top-

dressing." In this case it is necessary that it shall have been well fermented, or the exposure to the sun will cause the escape of a great deal of ammonia in some volatile form.

In preparing the manure there are other considerations which must influence the farmer. Its quality will largely depend upon the animals which contribute to it. Thus the dung of each class of beast used on the farm has its own peculiar features. Generally the bulk of the manure-heap is composed of the dung of horned cattle. This contains a large proportion of water, and will not heat quickly. The droppings from horses are drier and hotter. In composition, too, horse manure contains more nitrogenous matter than does that of either oxen or pigs. To prepare a manure-heap to the greatest advantage, therefore, all of the different kinds of farm animals should be kept and the manure from all thoroughly mixed together, to make the heap as uniform as possible.

Again, the age and condition of the animals have an important bearing on the subject. Granted that two animals are fed on the same food, a young one will retain in his own body much more phosphorus, more nitrogen, and other elements than will one which is already mature. The older animal will so contribute more of these valuable fertilising elements to the manure than the younger will. The same considerations apply to lean and fat animals, and such as are forming stores of other animal foods, as milk.

Perhaps, however, the most important thing to be considered in the production of farmyard manure is the quality of the food which is given to the animals. If, on the one hand, animals are fed on linseed-cake or similar material, and, on the other hand, others are given roots of good quality, such as turnips or carrots, the manure from the former will be worth perhaps twenty times as much as that from the latter. This difference in value results from the fact that the oil-cake is very rich in nitrogen, phosphoric acid and potash. In classifying food-stuffs, therefore, from this point of view, we should put oil-cake first, while following next in order, we might quote peas and beans, and, further down, malt dust, bran, clover, etc. Roots would come very low on the list.

We have already seen that the droppings of animals are sometimes applied to the land without any admixture of straw. This is usually carried out by penning animals, very generally sheep, over certain fields. In grazing countries the grass land is very generally manured by both sheep and cattle. Some arable land is often supplied similarly by sheep being shut up for the night in a fold, which is moved a little every day, so that all the field in time receives a supply. It is very important in applying manure in this way that it shall be evenly distributed. If there is an accumulation in one spot the herbage growing there is forced too much, and in its growth it becomes rank and unpalatable. If the sheep are allowed to remain in a field without being confined at night in a fold they tend to select particular spots for their rest, and their favourite places receive more than their share of the manure. The result is that the next crop for which this manuring is being carried out grows irregularly, the straw in particular being much stronger in these parts than others, and so the crop does not come kindly and equally to maturity.

The method of green crop manuring, which is often used, has several drawbacks, but on the whole the advantages outweigh them. It is usual to cultivate a hardy strong-growing plant which sends its roots deeply down into the subsoil. Many of our leguminous plants, such as clover, are selected for this purpose. When the plant has reached a good degree of development, the field is ploughed up, and the growing crop so buried in the soil. Though at first sight this looks to be very wasteful, it is not really so, for all that the plants have taken out of the land is thus restored to it again, and as it decomposes, the various elements are made available for the next crop. The advantages which are most easily seen are that the strong deep-rooted plants have drawn upon the reserve food-materials of the subsoil, and have thus made them available for a shorter-rooted plant that could not otherwise have reached them. Further, the mineral constituents and the nitrogen which the clover has taken up from the soil are restored to it in just the right condition for the next crop to use them.

Of artificial general manures, none has been found so useful as the one commonly known as Guano. This is imported in large quantities from islands off the coast of Peru. It is really a natural manure, being composed of the dung of sea fowl, which has been stored there for ages. Its value depends upon the very large amount of nitrogenous material which it contains. It is also very rich in phosphorus. It is not necessary to do anything to it on the farm, as it can be applied directly to the soil. The farmer uses it as a rule to supplement the farmyard manure, though it is very serviceable when employed alone.

Other artificial manures are rather to be regarded as belonging to the second class, or those specially adapted to particular crops, and we shall consider them later.

To recapitulate, we have seen :—

1. That for various reasons a farmer has to add to his land from time to time certain constituents which the crops require, or which serve to convert the dormant stores of food into the active condition. These are known as manures.

2. That there are two classes of such manures, some being useful in *all*, others only in *special* cases.

3. That the most important of all of the first class is the farmyard manure which the farmer prepares upon the farm.

4. That the composition of this depends upon a great many circumstances, of which the most important are :—

(i.) The mode of its manufacture, whether in open or covered yards, or pits.

(ii.) The way in which it is allowed to ferment.

(iii.) The kind, age, and condition of the animals which contribute to it, and the food which is supplied to them.

5. That frequently the droppings of animals are applied directly to the land by penning or folding them upon it.

6. That frequently a green crop is ploughed into the soil of the field on which it has grown, restoring to the land what it has taken out of it in a form most suitable for the next crop.

7. That Guano, an artificial general manure, is often used to supplement farmyard manure.

(*To be continued.*)

TEACHERS' NOTES OF DRAWING LESSONS FOR STANDARD IV.

By E. BUFFERY RIDGE, *Art Master under the London School Board.*

FREEHAND FOR STANDARD IV.

To get thin lines—depend on lightness of hand, not on sharp pencil points.

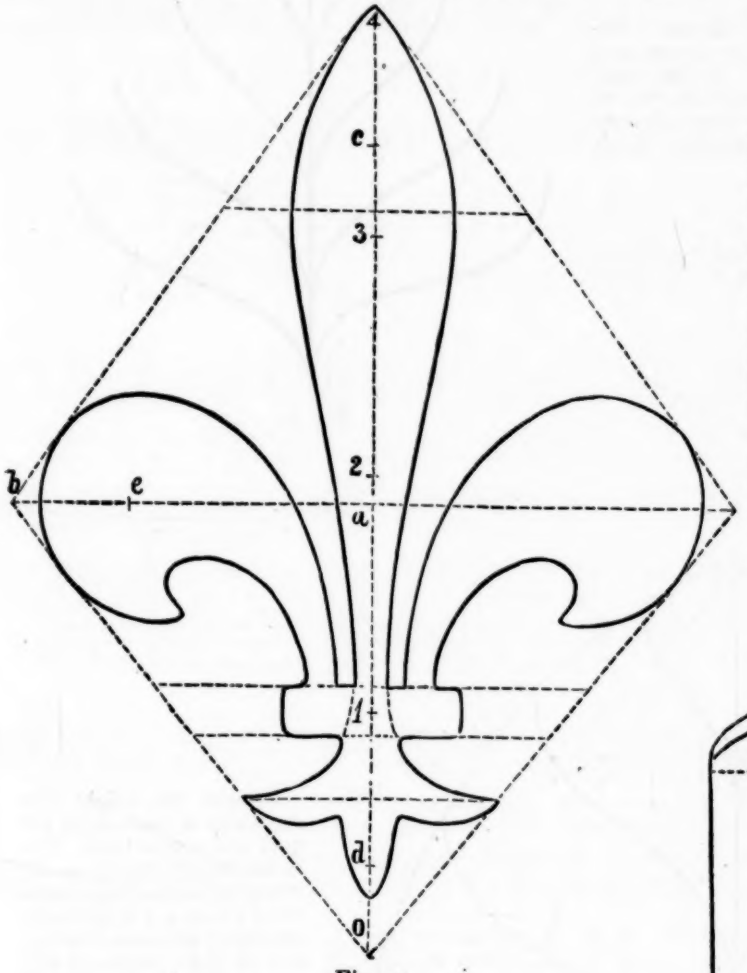


Fig. 12.

20. Examination copy. Divide a centre line into four equal parts, as at 0, 1, 2, 3, 4, and use these parts as measurements to compare other lengths with. A little below 2 draw the principal cross line. One of the four parts of the upright would reach from *a* to *e*, so that about half a part more would give *b* the end of the cross line, and *a b* would reach up to *c* or down to *d*. Draw the four slanting outside lines. Half the cross line just above 3 gives the width of the middle leaf.

There are many corners in this copy, but none of them are quite sharp; mind this in lining in.

21. Examination copy. Square glass bottle. In a bottle of this kind the edges are never quite straight, but in the copy they may be drawn straight.

Divide the centre line into four equal parts, draw a cross line at *a* just above 3 and make it equal to one part each side, then the width will be half the height. Divide *a d* into three equal parts; one of them shows the width of the neck at *b*, another the upright edge *c e*. At the bottom let *e f* slant upwards a little and *e g* a good deal more.

Make the *lip* round, the *neck* upright and straight, and the *shoulder* slanting and curved.

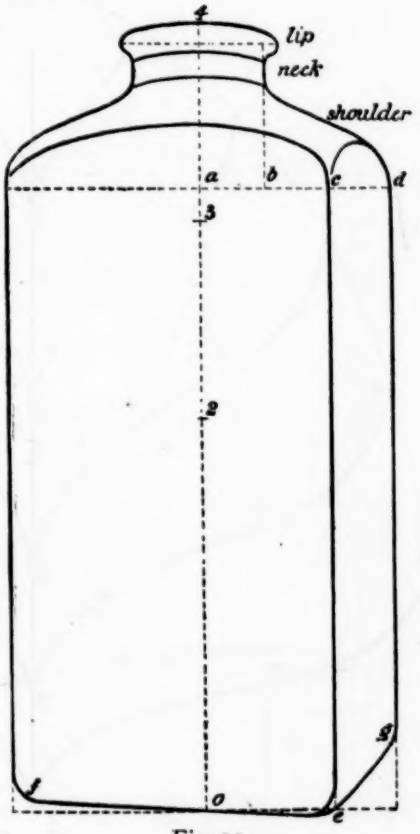


Fig. 13.

22. Examination copy. Harmonic curves. The notes of music which are sung together in a part song harmonise or agree with each other. In the same way the curves down one side of this copy are said to harmonise with each other. If a boy sings a wrong note it spoils the whole effect of the singing. Look at this :—

One curve on each side fails to harmonise with the rest, and so the copy is spoilt. Which are the false notes?

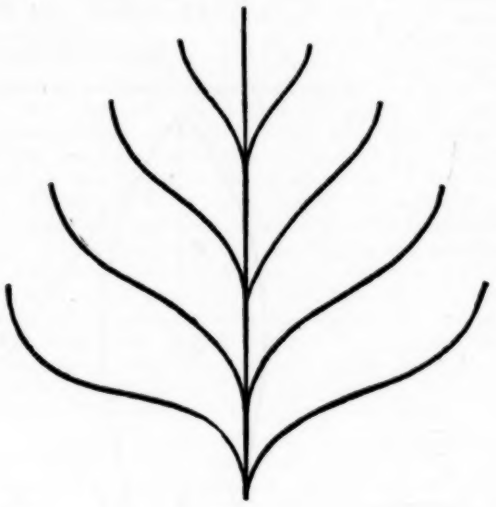


Fig. 14.

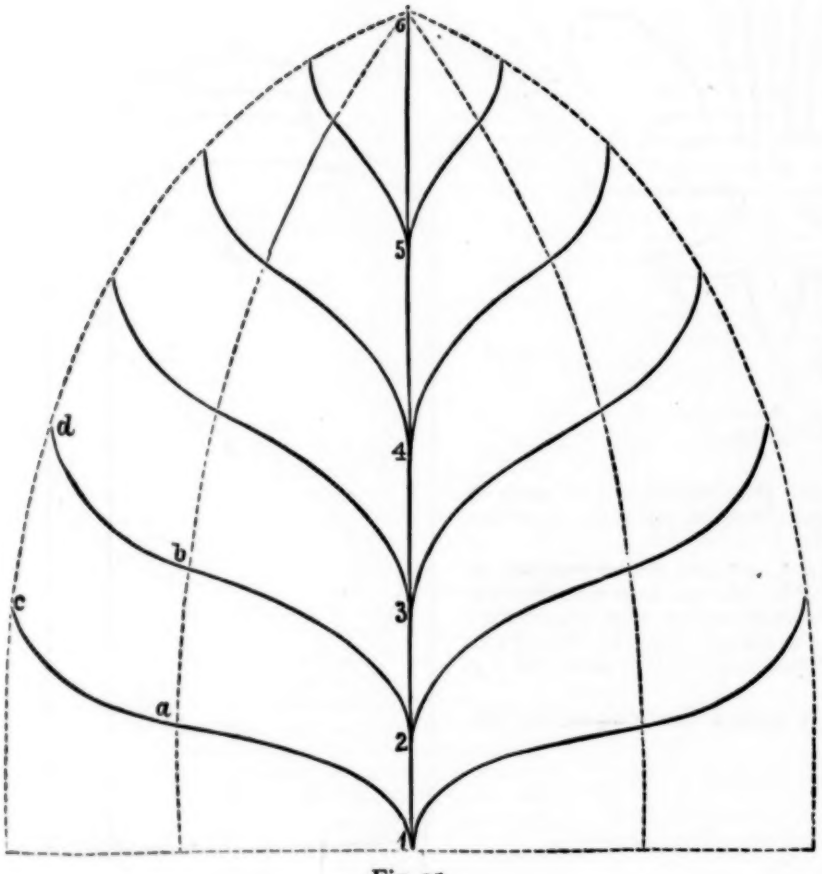


Fig. 15.

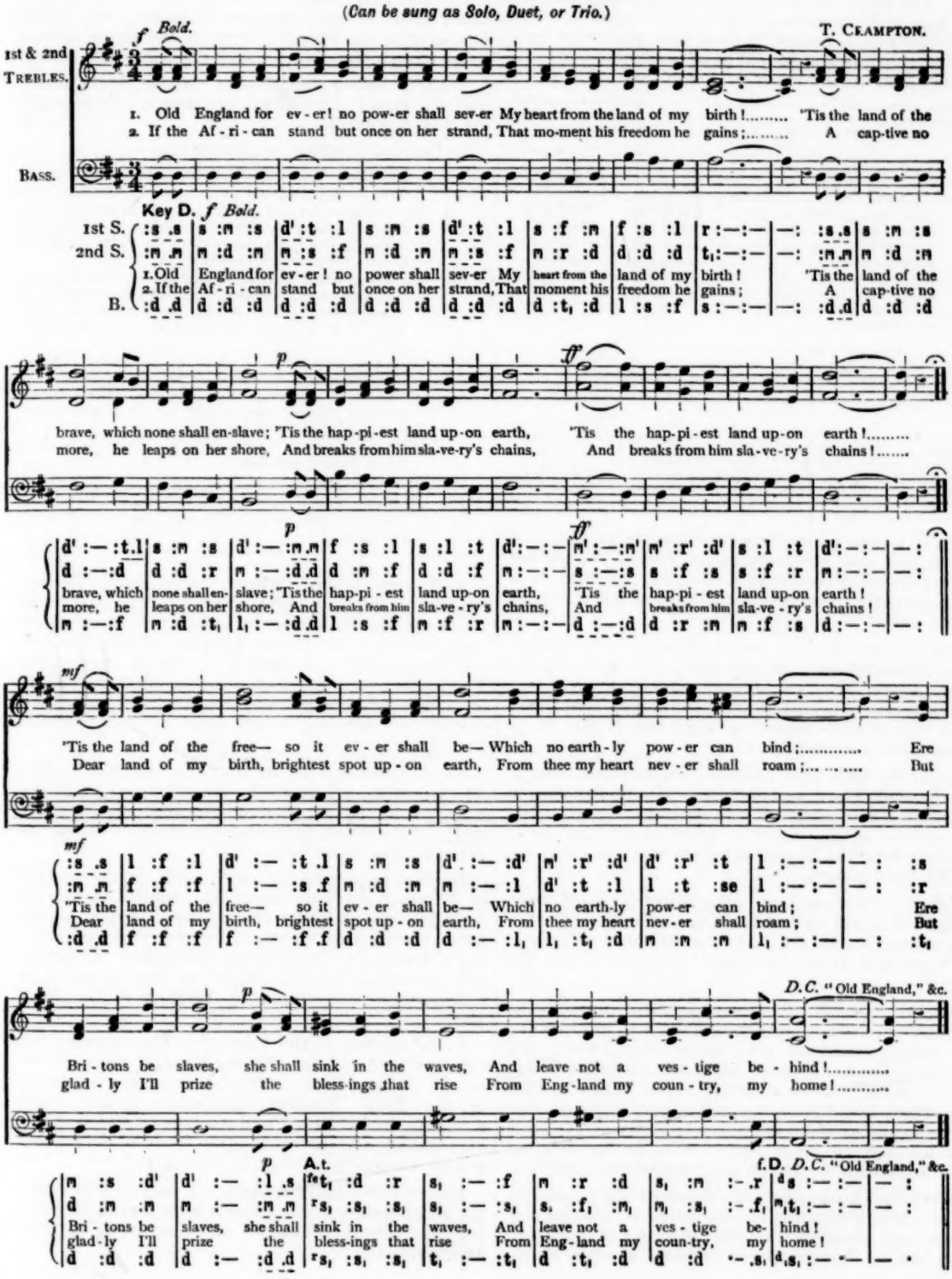
Compare the height with the width at the bottom and draw the dotted lines. The inside dotted lines show the changing points of the curves. Mark 1, 2, 3, 4, 5, 6, gradually enlarging distances from bottom to top. Mark *a b*, etc., about equal distances, and *c d*, etc., getting less from bottom to top. Rub out dotted lines, but not the centre line. Be particularly careful in making the curves *flow into* the centre straight line.

(To be continued.)

OLD ENGLAND!

(Can be sung as Solo, Duet, or Trio.)

T. CRAMPTON.


1st & 2nd TREBLES.
BASS.
f Bold.
1. Old England for ev-er! no pow-er shall sev-er My heart from the land of my birth!..... 'Tis the land of the
2. If the Af-ri-can stand but once on her strand, That mo-ment his freedom he gains;..... A cap-tive no
Key D. f Bold.
1st S.
2nd S.
1. Old England for ev-er! no power shall sev-er My heart from the land of my birth! 'Tis the land of the
2. If the Af-ri-can stand but once on her strand, That moment his freedom he gains; A cap-tive no
B.
p
ff
brave, which none shall en-slave; 'Tis the hap-pi-est land up-on earth, 'Tis the hap-pi-est land up-on earth!.....
more, he leaps on her shore, And breaks from him sla-ve-ry's chains, And breaks from him sla-ve-ry's chains!.....
brave, which none shall en-slave; 'Tis the hap-pi-est land up-on earth!
more, he leaps on her shore, And breaks from him sla-ve-ry's chains!
mf
'Tis the land of the free— so it ev-er shall be— Which no earth-ly pow-er can bind;..... Ere
Dear land of my birth, brightest spot up-on earth, From thee my heart nev-er shall roam;..... But
'Tis the land of the free— so it ev-er shall be— Which no earth-ly pow-er can bind; Ere
Dear land of my birth, brightest spot up-on earth, From thee my heart nev-er shall roam; But
D.C. "Old England," &c.
Bri-tons be slaves, she shall sink in the waves, And leave not a ves-tige be-hind!.....
glad-ly I'll prize the bless-ings that rise From Eng-land my coun-try, my home!.....
A.t.
f.D. D.C. "Old England," &c.
Bri-tons be slaves, she shall sink in the waves, And leave not a ves-tige be-hind!
glad-ly I'll prize the bless-ings that rise From Eng-land my coun-try, my home!

PUPIL TEACHERS' COURSE.

1. THE following interesting statistics, compiled from the annual AGRICULTURAL returns for GREAT BRITAIN AND IRELAND, collected in June last year, have only just been issued, and should be of considerable use.

Occupiers of land in *Great Britain* are 578,474.

Description of Land.	Area in Acres.	
	1891.	1890.
Total cultivated area	48,179,473	48,045,755
„ permanent pasture	27,567,663	27,115,425
„ arable land	20,611,810	20,930,330
„ woodland	3,007,569	Untrustworthy
„ under corn crops	9,443,509	9,574,249
„ under green crops	4,510,653	4,534,145
„ under rotation crops	6,013,685	6,097,210
„ fruit crops	60,138	46,733
„ bare fallow	451,203	524,112

Live Stock.	Numbers.	
	1891.	1890.
Horses	2,026,170	1,964,911
Cattle	11,343,686	10,789,858
Sheep	33,533,988	31,657,195
Pigs	4,272,764	4,362,040

As in former years, these returns show the decline of the farmer and the comparative rise of the grazier. Serious as is the competition from foreign meat, it is insignificant compared with the importation of foreign bread-stuffs.

As late as 1871 the excess of arable over pasture land amounted to 6,000,000 acres. From the figures given above, one cause of the current of migration from country to town districts is laid bare; for pasture land will neither employ so many hands nor fill so many mouths as arable land.

2. At the last Pupil Teachers' Examination most of the Second Years were ignorant of the position of Manipur. The question was, of course, propounded on account of the recent troubles there; and for a similar reason the locality of Gilgit may be asked for in the April papers.

Gilgit is a frontier post of the British, situated south of the Pamir and west of Cachmire. To the north of this military station are the two small but hostile states of Nagar and Hunza, interposed between it and the Pamir.

Recent Russian advances and tribal engagements decided our Indian Government both to improve the exceedingly wretched road from Gilgit, along the Hunza valley, to our most advanced station at Chalt, and to extend it in the direction of the Hunza capital. The usual hostility to the preliminary measures was shown by the natives; so our local commander, Colonel Durand, captured their fort of Nilt, further defeated them higher up the valley, and *pacified* the district.

From the Pamir, where the Russians are present in considerable force, the Hunza valley is very easy of access, and therefore the strengthening of our hold upon one of the approaches to India, whereby an invader from Central Asia might penetrate, is a measure of much political and strategic importance.

3. *Hints on Arithmetic.*

In First Year Boys' Arithmetic the favourite questions are (*a*) to draw diagrams illustrating the results of operations in Vulgar Fractions, and (*b*) to demonstrate certain theorems respecting Decimal Fractions.

Both in *Dixon and Beach's* 'GIRLS' ARITHMETIC' and *Wollman's* 'TEACHERS' ARITHMETIC' these points are well attended to.

In Decimal Fractions remember that—

(*a*) Every Vulgar Fraction whose denominator contains any other factor than 5 or 2 will circulate as a decimal.

(*b*) The number of decimal places cannot be as many (without recurring) as the number represented by the denominator. Thus, if the denominator be 7, the number of decimal places will not exceed 6.

(*c*) In a non-recurring decimal the number of places depends upon how many times the factors 2 or 5 are present in the denominator. Thus, if the denominator is either $5^4 \times 2^3$ or $5^3 \times 2^4$, there will be 4 figures in the decimal.

(*d*) When a recurring decimal, whose denominator is n extends to $n - 1$ figures (and in this case n is always odd, and therefore $n - 1$ always even), when half the figures are obtained, the remainder may be at once written down—$\frac{1}{7} = \cdot\dot{1}42857\dot{1}$ is a good instance.

After obtaining 142, the remaining 857 can easily be found by subtracting each figure of 142 from 9.

$\frac{1}{17} = \cdot\dot{5}8823529411764\dot{7}\dot{0}$.

Here also the first eight figures, 58823529 subtracted from 99999999 will yield as answer the second eight, 41176470.

(*To be continued.*)

4. A subject that almost every Pupil Teacher neglects is Reading aloud, and yet there is scarcely anything that requires more practice. Most people read aloud as if they themselves were the only listeners, and there were none others to inform or impress. There is a vast amount of mincing, affected, prudish, or careless and monotonous Reading, and really good elocutionary Reading is set down as theatrical and showy.

Reading aloud is an art; and the true Reader, like all true artists, will forget to be self-conscious in the endeavour of setting forth to the best advantage by means of his skilled experience the ideas or descriptions of the author before him.

No day should pass without audible practice either of Reading or Recitation. In default of human listeners, declaim to the chairs, the cabbages, or the stars. It is a great mistake to suppose that the Teaching of Reading to the Scholars will suffice. Doubtless it is an assistance, but it should be supplemented as recommended above, and by Reading to the Head Master.

In the opinion of the Education Department (Circular 297), 'A judicious School Manager may, without interfering in any way with the duties and authority of the Head Teacher, occasionally render useful service by inviting the Pupil-teachers to read aloud in his presence, and by encouraging those whose reading is most accurate, pleasing and intelligent.'

However this may be, there are many cases where the Pupil-teacher might in turn be of service in hearing the School Manager, and dispensing a little judicious praise.

PUPIL TEACHERS' ROUTINE FOR **MARCH.**

DAYS	YEARS	FIRST WEEK			SECOND WEEK			THIRD WEEK			FOURTH WEEK		
		1st Lesson	2nd Lesson	3rd Lesson	1st Lesson	2nd Lesson	3rd Lesson	1st Lesson	2nd Lesson	3rd Lesson	1st Lesson	2nd Lesson	3rd Lesson
Monday	1	Analysis and Parsing	Revise Dates	Maps of Wales and Scotland	Composition or Paraphrasing	How to teach Writing	Geography of Scotland	Analysis and Parsing	How to teach Arithmetic	Maps of England and Ireland	Composition or Paraphrasing	Revise Dates	Geography of Australia
	2			Maps of France and Italy		Notes of an Arithmetic Lesson	Latitude and Longitude		Notes of a Lesson on Form	Map of Spain Map of Coast from Gibraltar to Venice			Geography of Europe
	3			Map of India			Geography of Asia or Africa			Map of Mediterranean Sea			Geography of Africa
Tuesday	1	Euclid Definitions, etc. Paper Patterns	Abstract Vulgar Fractions Practice	Scripture or Revision	Euclid I., 1 to 4 Paper Patterns	Vulgar Fractions of Money Bills of Parcels	Scripture or Revision	Euclid I., 5 to 9 Practise Stitches	Vul. Fractions of Weights and Meas. Add. of Vul. Fracs.	Scripture or Revision	Euclid I., 10 to 13 Practise Stitches	Brackets in Algebra Any Geography	Scripture or Revision
	2	Euclid I., 1 to 7 Paper Patterns	Simple Proportion Money Vulgar Fractions		Euclid I., 8 to 15 Flannel Patch	Stocks Vulgar Fractions of Weights		Euclid I., 16 to 21 Practise Stitches	Percentages Reduction of Vulgar Fractions		Euclid I., 22 to 26 Practise Stitches	Algebraic Factors Any Geography	
	3	Euclid I., 1 to 15 Paper Patterns	Comp. Proportion Any Vulgar Fractions		Euclid I., 16 to 26 Practise Stitches	Equation of Payments Decimals of Money		Euclid I., 27 to 38 Any Needlework	Discount Decimals of Measures		Euclid I., 39 to 48 Any Needlework	Simple Equations Any Geography	
Wednesday	1	History from 55 B.C. to 410	Composition or Paraphrasing	Any Advanced Work	History from 410 to 871 A.D.	English from Text Book	Any Advanced Work	History from 871 to 1016 A.D.	Prefixes, Roots, or Affixes	Any Advanced Work	History from 1016 to 1066 A.D.	English from Text Books	Any Advanced Work
	2	History from 1066 to 1135 A.D.			History from 1135 to 1215 A.D.			History from 1307 to 1376 A.D.			History from 1422 to 1485 A.D.		
	3	History from 1485 to 1547 A.D.			History from 1547 to 1588 A.D.			History from 1628 to 1649 A.D.			History from 1666 to 1688 A.D.		
Thursday	1	Geography of England	Addition of Algebra. Any Arithmetic	Literature, Repetition, and Writing	Geography of Ireland	Subtraction of Algebra Any Dates	Dates	Geography of British North America	Multiplication of Algebra Any Grammar	Dates	Physical Geog. of Mountains and Rivers	Literature, Repetition, and Writing	Division of Algebra Any Dates
	2	Geography of Europe	Addition of Algebra Any Arithmetic		Geography of India	Subtraction of Algebra Any Dates	History from 1215 to 1307 A.D.	Geography of India	Multiplication of Algebra Any Grammar	History from 1376 to 1422 A.D.	Climates and Productions of our Empire		Division of Algebra Any Dates
	3	Geography of Asia	Simple Equations Any Arithmetic		Geography of Africa	G.C.M. of Algebra Any Dates	History from 1588 to 1628 A.D.	Geography of Asia	Mensuration of Triangles Any Grammar	History from 1649 to 1666 A.D.	Winds and Ocean Currents		Mensuration of Parallelograms Any Dates
Friday	1	Abstract Decimals Household Accounts	Any Advanced Work	Any Advanced Work	Decimal Fractions of Money Practice	Any Advanced Work	Any Advanced Work	Dec. Fractions of Weights and Meas. Subt. of Vul. Fracs.	Any Advanced Work	Any Advanced Work	Reduction of Fractions Bills of Parcels	Any Advanced Work	Any Advanced Work
	2	Comp. Proportion Reduction of Vulgar Fractions			Averages Vulgar Fractions of Measures			Stocks - Vul. Fractions of Weights and Meas.			Any Problems Simple and Compound Practice		
	3	Stocks Simple Proportion			Square Root Repeating Decimals			Stocks Decimals of Weights			Discount Simple Proportion		
Saturday	1	Language	Science	Drawing	Music	Language	Science	Drawing	Music	Language	Science	Drawing	Music	Language	Science	Drawing	Music
	2																
	3																

A FEW SUITABLE QUESTIONS.

First Year.

1. *Boys.*—What fraction is that from which if $\frac{3}{4}$ of $\frac{3-1\frac{1}{2}}{2\frac{3}{4}}$ be taken, and the remainder be divided by $\frac{15\frac{1}{2}}{16\frac{3}{4}}$ the result will be $\frac{1}{2}$?

Ans. $\frac{55}{124}$.

Girls.—There are four measures, 3 feet, 3½ feet, 5 feet, and 4 feet 7 inches respectively. What is the shortest length of rope which can be exactly measured by them all? Ans. 1,155 feet.

2. Which method of subtraction, that by 'Equal Additions' or 'Decomposition,' do you prefer; and why?

3. Write in Large hand the words, '*In gladsome bowers.*'
Write in Small hand the words, '*In gladsome bower fair Una sat, reclined.*'

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'*Can any* mortal mixture of *earth's* mould
Breathe such divine *enchanting* ravishment?
Sure something *holy lodges* in *that* breast,
And with *these* raptures *moves* the vocal air
To testify his hidden *residence.*'

5. Write a short essay describing a voyage from Liverpool to Quebec.

6. Give in full a table of Adjectives and pronouns.

7. Describe the physical features of Australia.

8. Draw a map of the Mackenzie with its connected lakes.

9. What was the social organisation of the early English?

10. Give dates of deaths of Hardicanute, Gunhilda, Anlaf, Penda, Arthur, Severus, and Boadicea.

11. Define the terms *pulse* and *measure*, and write our 4 measures both in three and two pulse, OR write both in Bass and Treble staves the following notes: A C G D F♯ E♭ B.

Second Year.

1. *Boys.*—One watch gains 4 minutes in 24 hours, another loses 2 minutes in 36 hours. They are both set right at noon on Monday. What is the real time when the difference between them is 15 minutes. Ans. Half-past seven on Thursday morning.

Girls.—Simplify $\frac{3\cdot5 - 2\cdot16}{\cdot25 \text{ of } (\frac{1}{3} + \frac{1}{4})} \div 15\cdot\dot{5}$. Ans. 1.

2. *Boys.*—The difference between the Simple Interest and True Discount on a certain sum in a year at four per cent. is £2. What is the sum? Ans. £1,300.

Girls.—Find the ratio of 23½ of 7 tons 2 cwt. 1 qr. 9½ lbs. to 21 tons 7 cwt.? Ans. As 70 : 9.

3. Writing as in First Year.

4. Where and what are the Kremlin, the Vatican, the Escurial, the Hague, Stamboul, and the Iron Gates?

5. Draw a map of the Tagus.

6. What are the following places noted for? Give dates if you can:—Plassey, Lucknow, Seringgapatam, Goojerat, Cabul, and Meerut?

7. Paraphrase the following and parse the words in italics—

'*If all* the world
Should in a fit of temperance feed on pulse,
Drink the clear *stream* and *nothing* wear *but* frieze,
The All-giver would *be unthanked*, would be unpraised,
Not half his *riches known* and *yet* despised;
And we should serve him *as* a grudging *master*,
As a penurious *niggard* of his wealth.'

8. Analyse the above passage, and explain the force of any prefixes or affixes.

9. Draw up a table of the battles during the Wars of the Roses, giving the dates, commanders, and results.

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Girls.—Draw on sectional paper (¼ size) the pattern of a woman's nightgown.

Third Year.

1. *Boys.*—Find the square root of ·00012 to five decimal places, and shew that $\sqrt{14\frac{3}{4}\frac{1}{6}} = 3\cdot8\dot{3}$. Ans. ·01095 +.

Girls.—A block of marble at the rate of 32s. a cubic foot cost £130. It was 6½ feet long and 3½ feet wide. What would it have cost had its thickness been 2½ feet? Ans. £87 15s.

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Girls.—If 4 men do as much work as 7 women, and 4 women do as much as 5 boys, and 7 boys as much as 16 girls, how many girls will do as much as 2 men? Ans. 10 girls.

3. Writing as in First Year.

4. Give examples of Teutonic and Classical derivatives formed by *internal* changes.

5. Analyse, and parse the italicised words—

'His *spear*, to equal *which* the tallest pine
Hewn on Norwegian hills, *to be* the *mast*
Of some great ammiral, *were but* a *wand*,
He walked *with* to *support* uneasy steps
Over the *burning* marle.'

6. Paraphrase

Nature would be surcharged with her own weight,
And strangled with her waste fertility;
The earth cumbered, and the winged air darked with plumes,
The herds would over-multitude their lords,
The sea o'erfraught would swell, and the unsought diamonds
Would so emblaze the forehead of the deep,
And so bestud with stars, that they below
Would grow inured to light, and come at last
To gaze upon the sun with shameless brows.

7. Draw a map of China.

8. Explain the origin, direction, and duration of the Trade Winds.

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Postero *die castra* ex eo loco *movent*. *Idem* facit Caesar, equitatumque omnem ad numerum quatuor millium, *quem* ex omni *provincia* et Æduis atque *eorum* sociis *coactum* habebat, *praemittit*, *qui videant* quas en partes hostes *iter* faciant.

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BY DR. GEORGE BEACH, M.A.,

Co-Author of 'A Manual of our Mother Tongue,' 'A Girl's Arithmetic,' Author of 'Elements of English,' 'Entertaining Readers,' etc.

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Applying the formula, it is plain that there cannot be figures of either one or two sides,

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$$\therefore \frac{2n}{n-2} = \text{"}$$

SCHOLARSHIP ROUTINE FOR MARCH, 1892.

DAYS	FIRST WEEK				SECOND WEEK				THIRD WEEK				FOURTH WEEK				
	First Hour	Second Hour	Third Hour	English Composition	First Hour	Second Hour	Third Hour	Repetition, Literature, and Penmanship	First Hour	Second Hour	Third Hour	English Composition	First Hour	Second Hour	Third Hour	Repetition, Literature, and Penmanship	
	Language	Science	Drawing		Language	Science	Drawing		Language	Science	Drawing		Language	Science	Drawing		
MONDAY	First Four Rules of Algebra, Proofs, etc. — Theoretical Needlework	History from 1688 to 1702	Language		Algebraic Fractions, with easy Denominators. — Ingredients of Food	Dates from 1688 to 1714	Language		Algebraic G.C.M. (Theory and Practice) — Rules of Health	History from 1714 to 1727	Language		Algebraic Fractions — Miscellaneous Arithmetic	Dates from 1714 to 1760	Language		
TUESDAY	Revise Definitions, Postulates, Axioms of Euclid I. — Calico Sampler	General Geography of North America	Science		Deductions upon Euclid, Book I. — Diagram of Chemise	Revise Geography of England	Science		Deductions upon Euclid, Book II. — Flannel Sampler	General Geography of Australia	Science		Second Book of Euclid — Calico Sampler	Revise Geography of Scotland and Ireland	Science		
WEDNESDAY	Cube Root — Square Root	History of English Language	How to teach Reading		Clock Sums	Paraphrasing and Dictation	How to teach Writing		Partnership	Parsing and Analysis	How to Teach Arithmetic		Stocks	Greek Roots	How to Teach Grammar		
THURSDAY	Algebraic Factors — Savings and Investments	History from 1702 to 1714	Parsing and Analysis		Algebraic G.C.M. (Theory and Practice) — Preparation of Food	England under the Romans	Study Table of English Literature		Algebraic Fractions — Clothing and Washing	History from 1727 to 1760	Text Book Study of English		Simple Equations — Miscellaneous Arithmetic	The Heptarchy	Paraphrasing and Dictation		
FRIDAY	First Sixteen Propositions of Euclid, Book I. — Flannel Sampler	General Geography of South America	Theory of Proportion		First Seven Propositions of Euclid, Book II. — Calico Sampler	Map of United States	The Metric System		First Thirty-two Propositions of Euclid, Book I. — Diagram of Chemise	General Geography of Polynesia (except Australia)	Stocks		Deductions upon Euclid, Book I. — Flannel Sampler	Map of Australia	Compound Interest		
SATURDAY	Language	Science	Drawing	English Composition	Language	Science	Drawing	Repetition, Literature, and Penmanship	Language	Science	Drawing	English Composition	Language	Science	Drawing	Repetition, Literature, and Penmanship	

$\therefore 2\frac{4}{n-3}$ = "

$\therefore \frac{4}{n-2}$ = "

but the only measures of 4 are 1, 2 and 4.

$\therefore n-2 = 1$ or 2 or 4

$\therefore n = 3$ or 4 or 6

$\therefore$ the required polygons are equilateral triangles, squares, and hexagons.

(6) Women candidates who have not been Pupil Teachers should especially study Domestic Economy and School Management. Calico samplers, flannel samplers, and paper patterns can be ordered through any respectable scholastic stationer, and will be found of great use.

In Notes of a Lesson all pupils should be careful not to be too formal. One style of Notes is not suitable for all sorts of lessons. The composition in this subject, as well as in History and Geography, is apt to become very 'slipshod,' and the mind becomes nauseated with the repetition of such words as '*elucidate*,' '*educe*,' '*elicit*.'

(*For Correspondence, see end of Certificate Article.*)

SELECTED GOVERNMENT QUESTIONS.

First Week.

1. Give a noun, an adjective and a verb formed from each of the following Latin words :—*disco, sedeo, scribo, verto, duco, dico.*

2. Analyse the following sentences, and parse the words in italics :—

(*a*) *How to deal* with him *was* a puzzling matter,

(*b*) *While* the lion and the tiger *were tearing each other*, the jackal *had run off* into the jungle with *his* prey,

(*c*) *Who* spills the foremost *foeman's* life
His party conquers in the strife.

3. Give a short sketch of the fauna of Australia and the district around the Rio Plata.

4. Draw a map of Australia, showing the character of the soil, the occupations and productions.

5. If your school is supplied with (1) a globe, (2) a sun-dial, (3) a mariner's compass and (4) a thermometer ; what use would you make of them ?

6. Give some rules which you intend to follow for securing (1) distinct articulation, (2) intelligent expression in reading.

7. Trace the descent of James I. from Henry VII., and of George I. from James I.

8. Point out the great political changes introduced by the Revolution of 1688, and sketch the character of William III.

9. Describe the intervals formed by the following pairs of notes :— C A E♭ or Doh Lah Re
E F C Me Fah Doh.

10. Explain briefly the following terms (*a*) Da Capo, (*b*) ♩ = M.90, (*c*) Crescendo, (*d*) Legato.

11. Two equal sums of money are divided, the one amongst 47 men, and the other amongst a certain number of women. Each man receives £1 4s. 6d., and each woman a shilling less. How many women are there ? Ans. 49.

12. Find by practice the cost of 13 cwt. 2 qrs. 23 lbs. 2 ozs 4 drms. at £1 17s. 4d. per quarter. Ans. £102 6s. 10½d.

13. (*Men only.*) To draw a straight line through a given point parallel to a given straight line.

Draw a line PQ parallel to the base BC of a triangle ABC and terminated by the sides AB and AC, so that PQ is equal to the sum of BP, CQ.

(*Women only.*) Show that by the aid of a blackboard or other apparatus, plain darning may be taught simultaneously to a large class.

14. (*Men only.*) Write out Euclid II. 1.

(*Women only.*) What effect is produced on the human body by food containing in large quantities the following substances respectively (*a*) sugar, (*b*) lime, (*c*) salt, (*d*) mineral oils ?

15. (*Men only.*) The area of an equilateral triangle inscribed in a circle is 36 sq. feet. What is the length of the side of the circumscribed equilateral triangle ? Ans. 18·24 feet.

(*Women only.*) What are the chief considerations to be attended to by a teacher with a view to the preservation of her own health, and that of her scholars during the hours of school work ?

16. (*Men only.*) An avenue is planted with trees 20 feet apart. If the trees had been planted 15 feet apart, the cost would have been increased by £5, at 2s. for each tree. What is the length of the avenue ? Ans. 3,000 feet.

(*Women only.*) State as precisely as you can the composition and nutritive value of (1) an egg, (2) lean beef, (3) beer, (4) cheese.

17. (*Men only.*) (*a*) Write down the factors of $x^2 + 3x - 10$; $x^4 - 1$; $9x^2 + 15x - 14$.

Ans. $\frac{(x+5)(x-2)\,;\,(x-1)(x+1)(x^2-x+1)}{(x^2+x+1)\,;\,(3x-2)(3x+7)}$

(*b*) Add together $\frac{1}{a-b} + \frac{1}{b-c} + \frac{1}{c-a}$.

Ans. $\frac{a(b-a)+b(c-b)+c(a-c)}{(a-b)(b-c)(c-a)}$

Second Week.

1. Analyse the following lines, and parse the words in italic :—

If I suffer *causeless* wrong,
Is then my selfish rage *so* strong,
My *sense* of public weal *so low*,
That for mere vengeance on a foe
Those *cords* of love I *should unbind*,
Which knit my country and my *kind* ?

2. Explain the term subjunctive mood, and give examples of its different uses.

3. Describe the aborigines of Tierra del Fuego, Mexico, New Zealand, Patagonia, and Australia.

4. What is an eclipse, a transit, an occultation ? Define the terms *penumbra, node, nadir.*

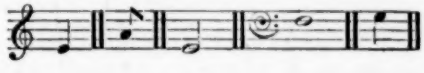
5. What sort of lessons would you give upon '*the phenomena of Nature and of Common Life*' ? Make out a list of twelve such lessons suitable for Standard I.

6. Of the two methods of explaining Substraction—(1) Equal Additions ; (2) Decomposition, which do you prefer, and why ? Illustrate your answer by a fully worked-out example.

7. Sketch briefly the gradual loss of the English possessions in France.

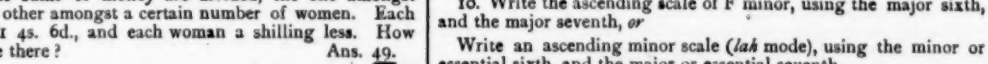
8. What do you know of the Norman influence in England before the Conquest ?

9. Write the pitch and duration names, with their corresponding rests of the following notes :—



or,

Re-write the following : (1) Halving the value of every note ; and (2) again, doubling the value of every note and rest.



10. Write the ascending scale of F minor, using the major sixth, and the major seventh, *or*

Write an ascending minor scale (*lah* mode), using the minor or essential sixth, and the major or essential seventh.

11. Work this sum in Long Division, and analyse it in such a way as to show to a class of children the meaning of each line, and the separate value of each figure in the quotient :—

Divide £175,869 12s. 4½d. by 23. Ans. £7,646 10s. 1½d.

12. Find the value of ¾ of $\frac{3}{10}$ of £13 6s. + ⅜ of ·01875 of £9 6s. 8d. — ⅛ of ·4⅗ of £1 6s. 10d. Ans. £1 1s. 5d.

13. (*Men only.*) Write out Euclid's Postulates ; and say what are the objections to the twelfth axiom.

What are Postulates, Axioms, Theorems, Problems, Corollaries ?

(*Women only.*) Explain the purpose of using different coloured cottons in teaching young children to sew, and give the proper measurements for the parts of a child's pinafore.

14. (*Men only.*) Write out Euclid II. 2., and state its converse.

(*Women only.*) Draw up an estimate for the winter clothing required by a woman of the labouring class and her daughter of 12 years old. What general directions would you give as to the choice of materials ?

15. (*Men only.*) A circle is 7 feet in circumference. Find the area of its inscribed square. Ans. 2·48 sq. ft.

(*Women only.*) What diseases may be caused by (*a*) want of cleanliness; (*b*) insufficient exercise; (*c*) mental worry? Give brief heads of advice in each case.

16. (*Men only.*)

(*a*) $\frac{x-3}{5}+\frac{x-7}{3}=\frac{x-9}{7}+9$. Ans. $27\frac{8}{11}$.

(*b*) $\frac{5x-9}{8}+\frac{7x-1}{10}=\frac{11x+7}{15}+6$. Ans. $x=13$.

(*Women only.*) Mention any respects in which the modern fashion of female dress is injurious to health. Give reasons.

17. (*Men only.*) Extract the square root of

$a^2b^2-4a^2bc+4a^2c^2+9b^2c^2+6ab^2c-12abc^2$.

Ans. $ab-2ac+3bc$.

Third Week.

1. Write out the rules for the spelling of those classes of words which include *receiving*, *judgment*, and *chargeable*.

2. Show that the following words may represent two or more parts of speech—*next*, *under*, *till*, *by*, *that*, *like*.

3. Draw a map of South Island (New Zealand).

4. Describe and comment fully upon the river systems of Australia.

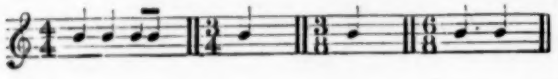
5. Make sentences showing how the same word is not always the same part of speech. Take as example the following words, and state in each sentence to what part of speech each one belongs:—*Long*, *near*, *but*, *that*, *rose*, *fly*.

6. Name some of the subjects appropriate for home lessons, and give a sketch of a week's home lessons for scholars in the Fourth Standard.

7. In which of the Tudor and Stuart reigns were England and Spain brought into political connexion—and how?

8. Give a short account of Magna Charta, The Reformation, and The Great Rebellion.

9. Complete each of the following bars by adding *one* note—



or,

Write the signs for two-pulse, four-pulse, six-pulse measure.

10. Describe the intervals formed by the following pairs of notes:—

E, C; F, A; C, E♭; *or* m, d; f, l,; d', ma.

11. Prove that $\frac{1}{4}=\frac{11}{44}$, and show by a diagram that 30¼ sq. yards make a sq. pole—a pole being 5½ yards long.

12. If a grocer gains one-eighth of the cost price by selling tea at 3s. per lb, how much per cent. would he gain if he sold the same tea at 3s. 4d. per lb. Ans. 25 per cent.

13. (*Men only.*) Write out Euclid I. 4.

If two triangles have two sides of the one equal to two sides of the other, each to each, and their included angles together equal to two right angles, they are equal in area.

(*Women only.*) Illustrate by diagrams, with suitable explanations, the teaching of plain sewing by the demonstration method.

14. (*Men only.*) Write out Euclid II. 2, and the corresponding algebraic formulæ of the two first propositions.

(*Women only.*) Explain how time may be economised in teaching Needlework by the use of the blackboard and other class apparatus.

15. (*Men only.*) The side of a square inscribed in a circle is 9 feet. What is the area of the circumscribed square?

Ans. 162 sq. feet.

(*Women only.*) '*Food is required for the supply of wasted material in the body, and for the production of heat.*' Explain fully what is meant by this statement, and say also what parts of our ordinary diet are useful for either of these two purposes. Why is water a necessary of life?

16. (*Men only.*) Divide $7x^2-\frac{1}{4}$ by $x+\frac{1}{2}$; and find the value of $\frac{x^2+y^2}{x^2-y^2}$ when $x=\frac{a+b}{a-b}$ and $y=\frac{a-b}{a+b}$.

Answers $7x-1$; $\frac{a^4+12a^2b^2+b^4}{8ab(a^2+b^2)}$.

(*Women only.*) What should be done, before the arrival of a doctor, in case of (1) convulsions in an infant; (2) a sprained ancle; (3) a deep cut; (4) burns and scalds; (5) choking.

17. (*Men only.*) $\frac{3x+2}{5}=\frac{5y-11}{4}+1$;

$\frac{3x}{2}+\frac{5y}{4}=25\frac{1}{4}$.

Ans. $x=11$, $y=7$.

Fourth Week.

1. Write a letter on '*Some public park*,' or '*A day's angling*.'

2. Paraphrase the following:—

'Ne'er have I seen the markets and streets so thoroughly empty!
Still as the grave is the town, cleared out! I verily fancy
Fifty at most of all our inhabitants still may be found there.
People are so inquisitive! All are running and racing
Merely to see the sad train of poor fellows driven to exile,
Down to the causeway now building, the distance nearly a league is;
They thitherward rush, in the heat and dust of the noonday.'

3. Where and what are '*The Great Barrier Reef*,' '*Plenty*,' '*Viti Levu*,' '*Falkland*,' '*Juan de Fuca*,' '*The Great Canon*'?

4. Explain the utility of statistics of Latitude and Longitude.

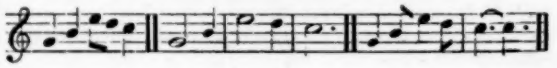
5. State how you would explain to a scholar in the Third Standard the value of the full remainder obtained in the division of 349 by 42, when the division is performed by 6 and 7 successively.

6. Work full notes of a lesson on *Complex Sentences*.

7. Give a short account of Catholic Emancipation, The Reform Bill of 1832, and the Repeal of the Corn Laws.

8. What events are connected with the following dates:—43, 410, 800, 871, 1066, 1171, 1215, and 1879.

9. Write the time signatures of the following:—



or,

Re-write the following: (1) Halving the value of every note, and (2) doubling the value.

| s :— .m | s : d' | s :— | —:— ‖

10. Describe the intervals formed by the following pairs of notes:—

B♭, F; C♯, G; D, B♭; or d', s; t, f; m, d.

11. State the rule for finding the least common multiple of two numbers, and prove it (as to a class) for the numbers 65 and 78.

Ans. 390.

12. A tradesman loses 9 per cent. by selling goods for £817 19s. At what price should he have sold them to gain 10½ per cent.?

Ans. £993 4s. 6d.

13. (*Men only.*) Write out Euclid I. 5.

All isosceles triangles upon the same base have their vertices in the same straight line.

(*Women only.*) Write out a receipt for making a shirt for a boy 4½ ft. high.

14. (*Men only.*) Write out Euclid II. 3 and 4.

(*Women only.*) Name the best ways known to you for making use of scraps and remnants of bread.

15. (*Men only.*) Find the side of a regular hexagon, which shall be equal in area to an equilateral triangle of 150 feet side.

Ans. 61·237 feet.

(*Women only.*) Explain in detail the different ways in which the Post Office gives opportunities for saving money. Give illustrations of each mode of investing savings.

16. (*Men only.*) Form the equation whose roots are 3 and −3. If $x^2+ax+576$ is a perfect square, what is the value of a?

Ans. $x^2-9=0$; $a=48$.

(*Women only.*) Do you think hot or cold food the more wholesome? Give your reasons, and add rules for keeping uncooked meat good.

17. (*Men only.*) A purse contains only threepenny and fourpenny pieces, equal in value to £2 10s. 7d. If the number of threepenny and fourpenny pieces were interchanged, the value would be £2 8s. 7d. Find the number of coins of each sort.

Ans. 73 and 93.

COMMON-SENSE LESSONS IN EVERY DAY HOUSEWORK.

BY MRS. E. A. SHARMAN,

Lecturer to the National Health Society,

Author of 'Family Cookery.'

Weekly Cleaning.

To Polish Furniture.—Almost one of the first things a girl learns to do is to polish furniture with beeswax and turpentine. At first this work is nothing but play to a little girl, but as she grows older she begins to find it real hard work rubbing furniture until it becomes so bright that she sees the reflection of her face upon it. It is very fascinating work polishing furniture, and work which pays for the labour bestowed upon it. Nothing looks nicer about a house than well-kept furniture, shining and clean, and having no dust holes about it, but which can only be kept in high order by cleaning it every week. Polishing furniture is not dirty work; any girl can do it if she chooses. There are several methods of cleaning, but none simpler or better than the old-fashioned way of polishing with beeswax and turpentine. It suits every kind of ordinary furniture, whether mahogany, walnut, or oak, while other methods are often suited only to special woods. To prepare beeswax for polishing with, shred one ounce of beeswax very fine, put it into a gallipot, which must be put into a cool oven until the wax is melted. Mix into it while hot, one ounce of turpentine, stir the mixture well together, put the gallipot back into the oven for a few minutes until well blended, and the wax and turpentine have become a soft paste. When the mixture is cold it is ready for use, and should be smeared upon the furniture in small quantities with a piece of old flannel, then rubbed with a soft duster in a circular direction until all the wax is removed, and finally polished with another soft duster. If the beeswax is not thoroughly rubbed off the furniture, dust and dirt would settle upon it in patches, and though shining, it would be sticky when touched, and would need to be washed off before it could be again cleaned. If all the paste has not been used, cover it carefully over with paper to keep the dust from it, or it will become dirty and smear the furniture when applied another time. Furniture can also be rubbed with a mixture of equal quantities of linseed oil and vinegar, put in a bottle, and always shaken before using. After dusting well, rub the mixture upon the furniture in small quantities at a time, polish quickly with two or three dusters, using an old silk handkerchief for the last rubber. I have found the following recipe an excellent *varnish* for furniture: Put into a gallipot two ounces of shredded beeswax and half an ounce of powdered black resin, melt them together slowly in the oven, then cool slightly, and mix in with a piece of stick one ounce of turpentine; stir the mixture well, and when cold it is ready for use. It should be kept in a bottle with a good tight-fitting cork. Use a piece of clean old flannel when cleaning, and rub it on in a circular direction, but finish the polishing according to the grain of the wood. The rubbing must be done quickly, so that the varnish has not time to harden. Home-made preparations are always to be recommended before patent polishes, creams, etc., because they do not form a sort of cake over the furniture. The mixture of oil and vinegar polishes as well as removes stains and grease, and does equally for cleaning oilcloth. Nothing keeps furniture in such good order as hard rubbing once a week; this removes finger marks without the use of furniture polish, but dirt and scratches require other treatment. Never use a dark-coloured furniture paste for polishing light-coloured woods, nor dirty rubbers at any time. Stale salad oil is excellent to use in polishing furniture. To remove stains from furniture, make a mixture of equal parts of sweet oil and turpentine, and rub the spots hard with it until they disappear, then wash with warm soapy water, and polish with a little plain oil or paraffin. A new soft paint-brush is a capital duster for carved furniture.

To Clean a Mirror.—If the mirror is enclosed in a gilt frame which needs renovating also, it will be well to examine the gilding first before beginning to operate upon it. There are two or three sorts of gilding—one done in oil gold is the natural colour of plain gold, and cannot be made to shine, but can be washed with water; another, which is known as burnished, or water, gilding, must not be wetted. If the gilt is laid on a coat of whiting, which can be easily perceived on mirrors, picture frames, ornaments, etc., by a crack or scratch upon the article, such gilding can be preserved from dirt and flies by covering with gauze or net. When gilt frames can be wetted, the following method renovates them nicely. Tinge a pint of cold water yellow with some flour of sulphur, then boil in it four bruised onions, strain off the liquid, and when cold wash any gilding with it, and when dry it will shine like new. When the frame of the mirror has been cleaned put half a teaspoonful of liquid ammonia into some lukewarm water, add a few drops of washing blue to tinge the water blue, wash the glass with it, using a piece of soft newspaper or washleather, and when dry, polish with an old silk handkerchief. Smoked and dusty globes of chandeliers may be cleaned by soaking them in warm soda water, then immerse them in tepid ammonia water, and scrub with a rather stiff brush, but not stiff enough to scratch, until clean; rinse in cold water and wipe dry.

Bedrooms and Beds.—The smaller the bedroom the more necessary it is to clean it weekly, while every day the dust and fluff ought to be wiped up with a damp cloth after the bed is made. It is better to have no curtains to beds in small rooms, as it is necessary to breathe good and wholesome air while sleeping. Curtains confine the air, harbour dust, and are a trouble to keep clean. Iron bedsteads are more easily kept clean than wooden ones, and not so difficult to set up and take down. The various parts should be marked, then no mistake is made in putting them together. An iron bed key is required to fasten and unfasten the screws. Lay strong brown paper over the iron laths to preserve the mattress from being cut or marked with rust. Beds require to be kept very clean, frequently aired, and in case of sickness, or yearly cleanings, taken to pieces, and the materials washed or picked in pieces, and the dust beaten out before they are again made up. Feather beds should always be well shaken, or the feathers will mat together in hard knots.

To Make a Bed.—First wash your hands and put

on a clean apron. If the bed has not already been stripped of the clothes, place two chairs at the foot; take each article of clothing off the bed separately and throw it over the chairs, shake the bed well, and turn it over; turn the mattress over occasionally, too. Lay the bed as square as possible, and put the under blanket upon it, put the bolster on, and above this the sheet, covering the bolster with it. Tuck the sheet in at the sides and foot of the bed; shake the pillows well and lay them on lightly; then the top sheet and blankets, one at a time, tucking each in separately; place the counterpane on, which should cover the pillows, and if there are any curtains they should be folded and laid across at the head, the ends meeting exactly together in the middle upon the pillows.

The Larder.—This is not often found in small houses, except in the country. In small town-houses a cupboard is used as a larder. It is impossible to keep the larder sweet without admitting fresh air into it. This can scarcely be done when it is situated in the kitchen of a house. If the larder is in a corner and near to the outer kitchen-wall, ask the landlord to have a tiny wire gauze, or zinc window, put into it. Keep the cupboard or larder frequently lime-washed, and very clean always. If there is no way of admitting air into the larder, it ought to be kept ventilated by leaving the door open occasionally. It should be kept clean and dry, and the wooden shelves and floor scrubbed weekly. Sometimes the larder is simply a wire gauze safe, having shelves and hooks, and placed against a brick wall outside the house. In that case it should be protected from the sun, and should be kept as clean as an indoor one.

Presses for linen are made with sliding shelves and drawers, and must be kept clean and tidy in the same manner as wardrobes and chests of drawers.

Cupboards in kitchens require cleaning every week. They should be often white-washed, the shelves and floors scrubbed, and, when quite dry, the shelves covered with clean paper. Put everything back into its place, and close the doors.

Cellars need air admitting into them often, and sometimes lime-washing, otherwise they become damp, and give a mouldy smell to the house, breeding vermin also.

Dust-bins, Drains, and Closets should be attended to regularly—daily, if possible, weekly always. Using boiling water, with soda dissolved in it, is one of the best methods of keeping these untainted and clean.

(*To be continued.*)

IN THE BABIES' ROOM: WHAT TO DO, AND HOW TO DO IT.

By J. W. Warren,

Inspectress of Infant Schools, Leicester School Board.

The object of these papers being to render help to those most in need, this month will find another babies' occupation described, instead of a continuation of the *sorting*. Teachers are advised to put the following simple game into operation without delay.

No. 1.—Play with Twists, Threads, or Chains.

Buy from the linendraper's a quarter of a pound of bonnet cotton—price about 6d—or very coarse knitting cotton. Cut it into lengths that shall correspond with the proportions of the lengths of different parts of the letters in the *printed* or *written* alphabet. In this way the small letters of the English Script *t* would require two lengths different, *a* two different, and so on. Three or four bundles of sizes should be cut ready for use, the lengths kept separate. Now, for your lesson. Take length *one* bundle, dip into water—a glass will do—wring slightly out, but *use them wet;* give each little child one, and with your own placed upon the sloping K. G. table or swing slate in an arch, discover you have made a *bridge*. Tell a story of a bridge, ever so little, ever so short, but let it be true to the nature of all bridges. After the story—after the interest has been roused—each baby will, with your help, place his wet thread in the form of a bridge, and you will notice that nearly every child, even those recently admitted, will *succeed*. In this fact lies the germ of right occupation that none are unable to follow. You reverse the position Find a *wash bowl, pudding basin*, what you will. Fit your story in—let me beg of you to make no forms in a perfunctory manner, leaving out the living truth that makes the work real to these mites. You have time to be slow and sure, truthful, and thorough — here, if anywhere, it is necessary. Now the main object is to encourage your class to make forms of all kinds; their eyes are quickly educated in this way to find the possibilities with such a simple material; be careful to correct every imperfect form. Talk to each one when you correct; never refuse attempted work, however imperfect it is—remember it is the day of '*little things*.' But to return to the actual work: We've made our bridge and bowl, now let us make a soldier. How must our soldier stand? *Straight up*. When he sleeps? *Down*. Tales of soldiers—simple stories—not of war, but of home-coming, marching, camp life. Seek to amuse in an innocent way. Remember the baby's brain is like a perfectly prepared clay, and every coarse impression remains—you cannot remould it ever. Now let us analyse our occupation. We mean ultimately so to train our darlings, that, when they wield the pen, *form* will be easy to them, and through the early, easy concrete lessons of their babyhood they will have all letters at their finger ends, not figuratively, but literally. Someone may say, How is it to be done with so simple a beginning, and so far wide of the mark? Is it? Well, look to your *script alphabet*: How many different forms will you find? Two—no more—*straight* and *curved* lines. Teachers are reluctant to believe that to teach these two as *elements* of writing is the right thing to do, but there can be no doubt about it to those who have worked on the plan.

Let us imagine another day's lesson—some few days after the introduction of this play. Each child has now *two threads*, the *first* size and the *second*; these two will, in time to come, make our *d h n* and several others; but our object now is to make some amusing forms, and later on we shall attain our ultimate object. We place our longer thread for a *whip handle*, the shorter forms *the lash*. A chat on tops and whips makes each baby able to form the whip with lash; by a little alteration in position it is converted into a danger signal, and a *game* follows, in which boys make

the signals, engines, carriages, bridges, and our play ends merrily. Teacher, do not be too idle to carry out the spirit of this delightful thread play. It will pass many a twenty minutes away for you; hundreds of objects can be devised; bright babies will make suggestions, and theirs will (as you will find out) always be from what they've seen—not talked about or imagined.

A word about the limit to be placed upon this particular play. To give a child more than four pieces, even after a year's work, would be fruitless, therefore the letters and objects should be made in *ones*, and can be grouped by letting two children join in their work; but no words should be attempted, and the names of the letters *should not be given*. You may attempt the sounds, but the idea is to teach *form*, not *sound*.

These wet threads should be used upon the children's desks, or, if you prefer it, in the wooden trays referred to in my last paper. No mess will be made, excepting by a clumsy teacher. When the threads are collected they should be rinsed in cold, clear water, and hung in bundles on nails for the purpose.

Three different lengths will be required to form all the letters of the alphabet well, and it will be a good plan to find out how many forms can be made when a child has given to him *all three*. After each length has been used separately, two should be combined, and afterwards three, and then the letters may be begun in their order of difficulty.

Length of threads—an eight-inch bundle, a six-inch and a three-inch. For the sake of simplifying matters we will call these lengths 1, 2, 3; 1 being eight inches and so on; letters d, g, and q are formed—can be formed, each with two No. 1 threads.

Letters a k n w x y z Nos. 1 and 2 threads.
Letters u p and h with two No. 2 threads.
Letters b f and v with Nos. 1 and 3 threads.
Letters e j l o and s with No. 1 thread only.
Letters c and i with No. 2 thread only.
Letters r and t with Nos. 2 and 3.

While letter m requires two No. 2 and one No. 1 to form it nicely. It may be found convenient to alter these lengths; but the proportions being kept, any length may be given, taking care not to let them be much smaller than those given above.

Combine the threads with the bean or bead placing. Sometimes, when the form has been laid with wet thread, let it be copied on the side with beans placed in the same form.

This and all occupations should only take up about fifteen minutes. Leave off before the children are tired—not when it is a fact, or it will be just too late to have done any real good. Let the children sometimes do just as they please with their threads, and encourage them to ask for another if it is needed to complete any figure in formation.

Threads can be used three months if washed in warm soapy water every four weeks. I have, in listing this play, mentioned *twists* and *chains*, but of the three it has been found easier to provide the thread. If chains such as are bought in markets for a penny could be used, they would, of course, be more durable, and most links yield easily to any form needed. The weight is a great advantage, and the lengths can be got by manipulation with ordinary pincers. Country districts with annual fairs should find no difficulty in obtaining these chains; strings of small beads also can be used. Do not try string or wool, neither is good; the twist is only a modification of the chain, and needs no special note.

I trust I have said enough to interest and encourage my friends' (the babies) teachers to try this play. They must do the forms over at home first—not even to these tots can we presume to go unprepared, if we look for the success that crowns 'earnest, strong endeavour.' Next month I shall give Ball making.

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STANDARD PROBLEMS.—STEP BY STEP.

With Blackboard Examples.

BY JOHN PENDLEBURY.

STANDARD III.

BEFORE proceeding to examine in detail the problems for Standard III., we would refer the reader back to the 'Introductory Remarks' and 'General Hints for all the Standards,' which preceded the examples for Standard II. in the February number. The remarks there made upon the vital importance of a solid groundwork of mental drill, as a prelude to the successful solution of problems on paper, are, if possible, still more applicable here. The mental exercises here, preparatory to Standard III. work, must, of course, include a repetition somewhat of that preceding Standard II., but, in addition *must* comprise a thorough drill in easy exercises dealing with money. *Pence table* must be thoroughly mastered and at the fingerends of the scholars. Simple mental *reduction* exercises must also be given in the daily ten minutes drill, such as changing pence to shillings, farthings and half-pence to pence and shillings, threepences, fourpences, twopences, and sixpences to shillings, guineas to pounds, half-crowns to pounds, etc., and the reverse of these operations. The meaning of sum, difference, product, quotient, half-guinea, crown, half-crown, florin must be thoroughly explained and mastered by the class. A teacher cannot too often ask his class such questions as:—What is half a million? (500,000.) What is a quarter of a million? (250,000.) What is meant by the quotient? (The *answer* to a division sum.) *Note.*—The scholars will most likely give as the answer to the last question 'a division sum.' This erroneous notion must be corrected faithfully at once; it is *not* the *division* itself, but the *answer* to the division sum. More might be urged at length for this mental drill and discipline, but sufficient has been said to show that it must be insisted upon daily, and systematically carried on. It will bring its own reward in its immediate train, and this will be manifest not only in the intelligent countenances of the individual boys and girls when trying to grasp the idea of a new problem, but also in the ready answers they give, always to the point, and in the logical way in which they will eventually always proceed step by step towards the solution required. An attempt to place the innumerable forms of problems expected to be solved by Standard III. under different heads so as to let none escape notice would be absurd, but the following are arranged somewhat in the order in which they may be best taught, and if they are carefully followed and explained to the class, no problem which we have omitted to notice particularly will present any difficulty to them. (The examples must be multiplied at the teachers' discretion.)

(*a*) *Problems bearing (principally) on Addition.*—(1) The number of boys in a school is twice the number of girls. The number of girls is twice the number of infants. The infants number 32. How many are there in the whole school? Before this is written on the blackboard, ask the following mental exercises: There are 10 boys in one room and twice as many in the next. How many in the second room? Ans. 20, that is, $10 \times 2 = 20$. How many in both rooms together? $10 + 20 = 30$. There were 4 oranges in one bag, twice that number in a second bag, and in a third bag twice the number of the second bag. How many were there in the second bag? 8. How many then in the third bag? $8 \times 2 = 16$. How many in all three bags? Here insist on the children realising that the total in the three will be the number in the first + the number in the

second + the number in the third, that is, 4 + 8 + 16 = 28 oranges. Place this upon the board as a model thus :—

4 = oranges in first bag
8 = „ „ second bag
16 = „ „ third bag
—
28 = „ „ all 3 bags.

Now take a concrete example and employ one of the *dullest* boys as assistant in front of the class. We say *dullest* advisedly, as he will serve as an excellent incentive to the other dull ones. Place 5 reading books, slates, rulers or other equally handy objects upon an empty form in front. From a pile of similar articles near, tell the boy to place in another heap alongside the first twice that number. When this is done let the boy place a third heap numbering twice the second. Whilst he is performing this rapidly let him count aloud so that all may hear the process as well as see it. Now let the class try to find out mentally, eyes fixed upon the three heaps, how many articles have been placed altogether on the form. Some may give one answer, some another. Don't say which are right or wrong. Let a dull girl come to the front and take up each article, beginning with the first heap, placing it back upon the original pile and counting the total number in the three piles aloud. This takes time, but will prove of immense value, and will stimulate interest in the work to a remarkable extent. Let one of the quickest boys now come and put down on the blackboard the various numbers in a similar form to the above and add them up thus :—

5 in first heap
10 „ second heap
20 „ third heap
—
35 „ the 3 heaps.—Ans.

Now proceed to the problem given above, questioning all the time thus: How many boys were there? Don't actually know, except that there are twice the number of girls? And how many girls are there? Twice the number of infants? And how many infants are there? 32. The children will readily see that here is the real starting point. Proceed: Place 32 on blackboard and write *infants* after it. How many girls? Twice 32. How many is that? 64. The quick ones will do these things mentally, but the duller ones may be shown how to obtain it by putting 32 in the *margin* and multiplying it by 2, thus :—

32 infants
2
—
64 girls.

and, similarly, with the next number, the boys. Place 64 under 32. How many boys? Twice 64, which equals 128. They will soon tell the teacher that to find the *total* we must *add up*, so that the sum when finished will appear thus :—

32 infants
64 girls
128 boys
—
224 total scholars.—**Ans.**

Similar examples to follow.

(2) John has £2 10s. more than Tom, who has £5. What have both together? Take two boys before the class. Give into one boy's hand 3 pennies and into the other boy's hand 6 pennies. How many has one more than the other? 3. How many have both? 9. Take all the pennies again. Give one boy 3, and give the other boy a certain number unknown by the class. Tell them that the second boy has 2 more than the first. How many has he? 3 + 2 = 5 How many have both? 3 + 5 = 8. Place this latter exercise upon the blackboard, thus :—

3 = first boy. 3 + 2 = 5 second boy
3 = first boy's
5 = second boy's
—
8 = both.—Ans.

The scholars will readily answer now in a manner similar to No. 1 above; and the problem No. 2 above must be solved thus on the blackboard :—

John = £2 10s. Tom = £2 10s. + £5 = £7 10s.

£	s.	d.	
2	10	0	= John's
7	10	0	= Tom's
£10	0	0	= both.

If the amounts are larger and entail more working the addition of the two to find the share of Tom may either be done upon the paper as part of the sum or in the margin. The foregoing will serve as detailed models of teaching methods to be pursued with the three remaining rules and with the combinations of them to be given at the end.

(*b*) *Problems bearing (principally) on Subtraction.*—(1) A boy has 100 marbles in one bag and 150 in another. He sells 50 from the first and 30 from the second. How many has he in the one more than in the other? Proceed as detailed in the 'addition' examples. Some such way as the following may be adopted: Give a boy 10 pencils in one hand and 5 in the other. Let him give another boy 3 from the first and 2 from the second. Let the boy then count how many he has in each hand remaining. How many more in one than the other? This will appear on blackboard, thus :—

10	5	7 left in one hand	
3	2	3 left in other hand	
10 − 3 = 7 left	5 − 2 = 3 left	7 − 3 =	= 4 more in one than other.—Ans.

Then side by side place example (1), thus :—

100	150	120 left in second bag
50	30	50 left in first bag
50 left	120 left	= 70 more in second than in first.—Ans.

(2) Girl has 5s. in one purse and 10s. in another. She spends 2s. 6d. from each. How much remains in one more than the other? Similar reasoning to the above, and is worked exactly similar, except that we deal with money; thus :—

s.	d.	s.	d.	s.	d.	
5	0	10	0	7	6	left in second
2	6	2	6	2	6	left in first
2	6 left	7	6 left	5	0	more in one than in the other.

These examples are worked in full so often because we consider it to be of the utmost importance that the children should all have a similar model to go by, and a similar manner of working, provided that the model be of the best. Such we have attempted to give. (3) In a regiment of soldiers there are 550 men. In another regiment there are 150 *less*. How many are there in both? The only point of difficulty here is to obtain the second number. I have 10 apples, my brother has 2 less. How many has he? 10 − 2 = 8. In our class there are 20 boys. In the next class there are 5 less. How many? 20 − 5 = 15. How many in our class more than in the other? 20 − 15 = 5. The boys will see, that to obtain a number, 2 or 5 less than a given number, we must *take* 2 or 5 from that number. (3) will be written thus :—

550 men in first regiment	550 in first regiment
150 less	400 in second regiment
400 men in second regiment	950 in both regiments.—Ans.

(*c*) *Problems bearing (principally) on Multiplication.*—(1) In a brick kiln there are 6,945 bricks. How many in 75 such kilns? Introduce thus: One boy has 10 marbles, how many have 5 boys? 50. A girl spent 6d. a day. What did she spend in 4 days? 24 pence = 2s. In one field there are 20 sheep. How many sheep in 10 fields? 200. The teacher must make it his special business at this point to ensure that the scholars realize that, as in the last exercise, in 10 fields there must be 10 *times* the number of sheep there is in one field, and to find 10 times 20 we must *multiply* 20 by 10. Give other examples, then proceed to question and work (1) thus :—

6,945 bricks in 1 kiln
75 kilns
—
34725
48615
—
520,875 bricks in 75 kilns.

(2) In a grocer's shop there are ten shelves, and on each shelf there are 15 boxes of biscuits. In each box there are six dozen biscuits. How many biscuits are there on all the shelves? Start thus: There are 3 books on each of 3 shelves, and each book contains 10 leaves. How many *books* were there? 3 × 3 = 9 books. How many times 10 leaves are there in 9 books? 9 times 10, which equals 90. The boys will easily see that this kind of problem is solved by continued multiplication. Number 2 will appear thus :—

15 boxes	72 biscuits in 1 box
10 shelves	150 boxes
150 boxes on 10 shelves.	3600
	72
	10,800 biscuits in 150 boxes.—Ans.

Let us here repeat that teachers must not expect their scholars to grasp the solution of the problem set from *one*, *two*, or *even three* mental exercises of the same nature, especially in the early part of the year. Don't assume that the scholars know too much, or that they are clearly following every step, even though they appear to be at the time. Constant repetition must be given so as to firmly fix the dominant idea into the child's mind. If they have been thoroughly drilled to work problems in Standard II., which are chiefly multiplication and division, this part will present least difficulty. (3) In a box there are 30 fifty-pound notes, 25 twenty-pound notes, 15 ten-pound notes, and 17 sovereigns. What is the total amount of money in the box? Give mental exercises such as: 2 five-pound notes? £10. 4 ten-pound notes? £40. How much together? £10 + £40 = £50. Others similar. Proceed with (3). What will 30 fifty-pound notes be? £50 × 30; that is, 30 times *one* fifty-pound note = £1,500. Treat other items similarly and in the same detail. The sum will appear as a model on the blackboard, thus:—

£	£	£	£
50	20	10	1,500
30	25	15	500
			150
£1,500	100	£150	17
	40		
	£500		£2,167 total in box.

Let those who can work any of the steps mentally do so, such as, 15 ten-pound notes = £10 × 15 = £150. A capital exercise here would be to give the children a problem to work on their slates, exactly similar except the numbers, and with the blackboard model in front of them. This remark applies to the teaching of all new cases of problems.

(*d*) *Division principally.*—(1) In a large orchard there are 59 apple trees, and the total number of apples produced is 469,876. How many is that for each tree? 7,964. Such sums as these present no difficulty whatever, if the children are taught (as explained in Standard II.) that *one* tree must produce a *fifty-ninth part*, if there are 59 trees, and to find that part we must *divide* by 59. (2) A gardener has 1,809 plants to plant out in 33 beds. He puts 17 on one bed. How many must he then put upon each of the other beds? Get the children to see that if 17 are put on 1 bed there are then only 1,809 — 17 = 1,792 remaining to be portioned out upon 33 — 1 = 32 beds, and each bed will contain a thirty-second part, that is 1,792 ÷ 32 = 56 plants on each bed remaining after the first has had 17 planted on it. All division problems are worked best on the principle explained above. Insist on children having a knowledge of finding any part of a number.

Combinations of the foregoing four rules. (1) If I spend 2s. 8d. for sugar, 4s. for butter, and as much for tea as for sugar and butter together, how much do I spend in all? 13s. 4d. Insist on the children putting down each item and the amount opposite, thus:—

	s.	d.
sugar =	2	8
butter =	4	0
tea =	?	

Here they will stick fast. Now comes teacher's chance to make the best of his *tact* and *drawing* or *leading* power. Tea = sugar and butter together, that is, tea = 2s. 8d. + 4s. = 6s. 8d. This *must* be done *mentally*. Then supply the 6s. 8d. in the missing line above, and finish thus:—

	s.	d.
sugar =	2	8
butter =	4	0
tea =	6	8
	13	4 = total money spent.

(2) The sum of two numbers is 69, and one is 13. Find the product of the two numbers. Introduce thus: The sum of 2 numbers is 10. One is three, what is the other? 10 — 3 = 7. Why is it 7? Because if one is 3, the other *must* be 7 if their sum is 10. Get the boys into the habit of giving reasons for their answers. You are thus able to gauge how far they are using their thinking powers. Get them also to frame their answers into correctly expressive words and sentences, not merely interjected words of one syllable. Never accept such answers from them. It will require patience and oversight, but will repay in many ways. Proceed to (2). 69 — 13 = 56. Therefore one number is 13, and the other 56, and the product of these is 56 × 13 = 728 Ans. (3) In a school there are 360 children. Of these 114 pay 4d. per week, and the rest 3d. per week. What will the total fees be? Speaking from our own experience it will be easier for the teacher to proceed on the following lines principally by question and answer. How many fourpences will be received? 114. What is 114 fourpences? If they have been thoroughly coached in reduction this will give no difficulty—

3)114

2s)38s.

£1 + 18s.

Now, how many left to pay 3d. a week? 360—114 = 246. How many threepences would they pay? 246.

4)246

2s)6½ + 6 pence.

£3 1s. 6d.

Then total fees will be £1 18s. + £3 1s. 6d. = £4 19s. 6d. = Ans. (Another way would be to find how many pence would be drawn, thus:—4 × 114 = 456d., and 3 × 246 = 738d., and 456d. + 738d. = 1,194d. = £4 19s. 6d.) (4) A farmer went to market with four £5 notes in his pocket. He bought 2 pigs at £2 10s. each and a cow for £12 10s. He sold his horse for 20 guineas; what did he take home? In all the sums of this kind the most important idea to be firmly fixed in the minds of the children is that we are dealing with two different amounts of money, viz.:—what the farmer *has* or what he *gets besides* what he *has*, and what he *spends*; and they must be taught to keep the amounts under these heads *strictly separate*. A good plan is to put down what he has and what he gets on the left-hand side, and what he spends or loses on the right-hand side. The keeping of these amounts separate must be a *hard* and *fast rule* and must *on no account* be broken. If this plan is adhered to it will save an endless confusion afterwards. For example—

£	s.	d.		£	s.	d.	
20	0	0	= money in pocket	2	10	0	} spent for 2 pigs
21	0	0	= money got for horse	2	10	0	}
				12	10	0	„ for cow
41	0	0	= total money.				
				17	10	0	total spent.

Now if he had £41 and spent £17 10s. we find what he has left to take home by *taking* what he *spends from* what he *had*, thus:

£	s.	d.	
41	0	0	money in pocket
17	10	0	„ spent
23	10	0	left = Ans.

(5) If a girl put 36 stitches on each of 3 three needles, and knit 120 rows, and then took one stitch off each needle every round in the next 3 rows, how many stitches would she have knit altogether? Let the children find how many stitches she put on the 3 needles. That is 3 times 36 = 36 × 3 = 108 in one row. She now stitches 120 rows straight off. How many has she done then? 108 × 120 = 12,960. Now guide the children in proceeding *one* row round at a time. How many stitches will she have on the next round? They will readily answer 35, especially the girls. Now how many stitches will she put on the 3 needles? 35 × 3 = 105. Next round = 34 stitches, and 3 needles = 34 × 3 = 102. Next round, *the last*, = 33 stitches and 3 needles = 33 × 3 = 99. Now find total stitches thus:—

12960
105
102
99

13,266 total stitches = Ans.

Typical Problems for Tests or for Teachers' Models.—1. If a boy saved £4 0s. 7½d. from his wages, and he spent 1s. 3d. for a necktie, £3 1s. 4d. for a suit of clothes, 3s. 6d. for a hat, 10s. 4d. for a pair of boots, what will he have left? (A. and S.) Ans. 4s. 2½d. 2. The Norman Conquest took place in the year 1066. Queen Victoria began to reign in 1837. Seventy-seven years before this George the Third began to reign. How many years after the Conquest did

he begin to reign? 1837 — 77 = 1760, and 1760 — 1066 = 694 years Ans 3. In a forest there were 12,656 trees. One-seventh of these were oaks, one-fourth of them ash trees, and the rest were birch trees. How many of these latter were there? (D. D. A. and S.) Ans. = 7,684. 4. If a goose weighed 9lbs., and was valued at 9d. per lb., how much would a flock of 25 be worth? (M. M. and Reverse Red. to £ s. d.) Ans. = £8 8s. 9d. 5. 17 boxes each contained 28lbs. of apples. If these were divided equally among 7 girls, how many lbs. would each get? (M. and D.) Ans. = 68lbs. each. 6. If I give half a crown to each of five men, and 6d. to each of 11 boys, how much shall I have left out of a £5 note? (A. and S.) Ans. = £4 2s. (*Note.*—The children *ought* and *must* be able to tell what 5 half-crowns or 11 sixpences are *mentally*.) 7. A man plants a score row of turnips, 25 in a row, and has 3 dozen stolen. How many has he left? (M. and S.) Ans. = 464. 8. A train carried 996 persons on Monday, twice as many on the Tuesday, 797 on Wednesday, 1,567 on Thursday, 971 on Friday, and 2,576 persons on Saturday. How many more were carried on the last three days than on the first three days? (A. A. S.) Ans. = 2,329. 9. A carriage and pair of horses cost one hundred guineas. Each horse cost £36 17s. 6d. How much did the horses cost more than the carriage? (A. S. S.) (*Note.*—See that the scholars recognise that it is a *pair* or horses that is mentioned.) £36 17s. 6d. + £36 17s. 6d. = £73 15s. Now £105 — £73 15s. = £31 5s. cost of carriage. Therefore £73 15s. — £31 5s. = £42 10s. Ans.

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MODEL ANSWERS TO CERTIFICATE QUESTIONS—1891.

History.

QUESTION I.—What measures did William I. take to prevent the feudal lords from becoming independent? How did his two sons afterwards keep them in check?

The Conqueror maintained his power and kept his rapacious barons in a state of dependency in two ways. The first way was to make every landowner pay *direct* homage to him for the land he held. This rendered the baron but a tenant-in-chief holding land at the king's pleasure. To prevent concentration of power on the part of any discontented lord he never gave a large compact estate, but small estates in different counties. His second plan was to render all the Law Courts dependent on the Crown. Thus he held the land, and the law was subservient to him. The king was supreme. At his death the Norman lords, headed by Bishop Odo, declared in favour of Robert. They foresaw a good time for themselves with the indolent Curthose on the throne. William Rufus, by such specious promises as the repeal of the forest laws and reduction of taxes, played off the English against them and won. Odo fled and the barons were checked.

When Henry successfully usurped the throne the barons again plotted against a government which promised to be too strict for them. The King was prepared. By his charter of liberties and a promise to restore the laws of Edward the Confessor, and still more by his marriage to the Saxon Princess Edith, he completely won all English hearts. Knowing that they were his sole support, he trained them in warlike exercises, and at Tenchebrai (1106) an English army avenged Hastings. Henry demolished the castles of the rebellious barons, and allowed none to be built except by special licence from the Crown.

QUESTION II.—From what different sources did Richard I. obtain money for his Crusade.

Cœur-de-Lion was a knight-errant. He longed to win imperishable renown on the Plains of Palestine, by wresting the Holy Sepulchre from Saladin. To this purpose he devoted the hoards of his father. For this purpose he sold church-lands, offices of state, honours and dignities to the highest bidder. England was converted into an auction mart. London would have been sold if a purchaser could have been found. For 10,000 marks he gave up the Suzerainty of Scotland, won by his father from William the Lion, and with good ground he is suspected of having profited pecuniarily by the Jewish massacres which occurred at his coronation.

QUESTION III.—Describe shortly the state of affairs which led to the rise of De Montfort to power.

In 1232, Henry III., whose mind had been poisoned by Peter des Roches, dismissed the faithful Hubert de Burgh from his justiciarship. For more than a quarter of a century, after this event the country was misgoverned. The land was inundated with Poitevins, Provençals and Frenchmen, all aspirants for Court favours, jealous of each other, but at one in their contempt for the English. Henry loved the French better than his own people. In short, England was for anyone but the English. The king was prodigal; this led to heavy taxation—vacillating. He ratified the Great Charter half a dozen times, and debased his manhood and kinghood by breaking it as often—always in leading strings. There were no ministers responsible to the country, and it was ruled, or rather misruled, by irresponsible clerks. England became an appanage of Rome. The pope derived as much income from this land of ours as the king himself. All these matters accelerated the crisis of 1258. But the barons by disunion among themselves lost all that they had gained by the Provisions of Oxford, and the King of France, having been chosen arbitrator between them and Henry, decided in favour of the latter. Civil war followed the decision, and at Lewes, in 1264, Simon de Montfort, head of the barons and round whom London and the great towns had rallied, defeated and captured Henry and Prince Edward.

QUESTION IV.—On what occasions in English history have the citizens of London taken a prominent part in political disputes?

When Stephen was captured at Lincoln (1141), Matilda proceeded to London. The citizens entreated her to pity their condition, but she in her arrogance imposed a further heavy tax upon them (taillage). This impolitic act drove the citizens to arms. They rose 'en masse' and the Empress and her Angevins were compelled to flee for their lives. For this act, Stephen allowed 1,000 of them the doubtful privilege of fighting in his cause.

On John's first rejection of the Charter (1215), the citizens of London invited the barons opposed to him to enter London. The City was proclaimed the rallying-place of all who were in sympathy with them. After the Magna Charta had been signed, the Mayor of London was chosen one of twenty-five barons to see to its due observance by the king.

The Londoners were again conspicuous for the firmness with which they supported Simon de Montfort. They gave him both men and money. This, together with the fact that they had pelted and hooted Queen Eleanor in her endeavour to escape to Windsor by the river, brought upon them the vengeance of Prince Edward at Lewes. During the Wars of the Roses Margaret's troops were repulsed by the Londoners, in their attempt to enter the City after their victory of St. Albans, and soon afterwards Edward was received with acclamation.

London decided against Charles at the outbreak of the Civil War. The City, together with the eastern counties, was a hotbed of Puritanism. The trained bands were placed under the command of Essex, and took part in many engagements, until the Army of the New Model was created, when they were placed under Skipton for the safety of the capital.

QUESTION V.—Show how the social evils of the time helped to render Wiclif's teaching popular.

In the latter part of the 14th century the peasants of England were ground to the dust by the yoke of villenage. They had a natural desire to cast off this yoke, but Parliament was equally determined to keep them in this bondage to the soil. They could get no aid from the Church. The greater prelates interested themselves more with political than religious and social matters, and the clerical corporations, being great landowners, had no desire to see serfdom abolished. A new chain was cast over the peasants in the shape of the Poll-tax, and this grievous imposition directly led to the rebellion of 1381.

Lollardism had a strong flavour of socialism. The 'Hooded Men' strove for political as well as religious reform. The three great objects they set before themselves were (1) Abolition of serfdom, (2) Reduction of taxes, (3) Confiscation of church lands for purposes of National Defence.

Hence the popularity of the cause among the villeins.

QUESTION VI.—Henry VII. ascended the throne with a Parliamentary title. What precedents were there for the regulation by Parliament of the Succession to the Crown?

Henry IV. based his claim to the throne on

a Right of Conquest.
b Lineage.
c Election by Parliament.

The first was fragile. There was no opposition. The second no better. There were descendants of Lionel, the third son of Edward III., living, and it was only the last which was recognised

by the people. The plots and intrigues of his reign taught him how unstable his throne would have been with the first two supports alone.

Edward IV. was called to the throne by Parliament. It is true that he had a strong claim by lineage, but this would have served him little if Henry VI. had possessed a tithe of his father's warlike ability. It was the intense desire to see anarchy crushed by a strong government, displayed by all classes, that gave him the crown.

The Parliaments of this period did not trouble themselves greatly about the law of primogeniture. It was not until the 17th century that this became the leading principle of succession to the throne of England.

QUESTION VII.—What were the main principles of Wolsey's (1) foreign, (2) home policy? On what charge was he finally ruined?

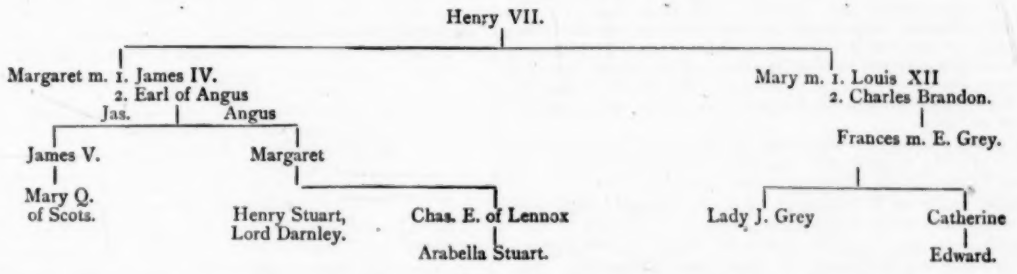
Wolsey's loadstone was the papal tiara. To obtain this he laboured assiduously and unscrupulously in the cause of Charles V., Emperor of Germany. In 1521 he was acknowledged mediator between Charles V. and Francis I. Before the conference sat, over which he was to preside, he was won over by the German Embassy, who promised that the Emperor should use his influence in Wolsey's favour at the next papal election. The conference was a mockery, the real points at issue having been settled beforehand. Twice the papal chair fell vacant during the next two years, and Charles never lifted his finger on Wolsey's behalf.

At home the great cardinal was careful to assume an obsequious manner whilst in the presence of Henry. But he was arrogant and unapproachable to all others. He was mainly responsible in bringing the Earl of Buckingham to the block. When Henry determined on war with France he looked to Wolsey to provide the sinews of war. The cardinal extorted £20,000 from the citizens of London, and asked for a tenth of their wealth. Twice he invaded the privileges of Parliament, and attempted to overawe the members by his state, whilst demanding a subsidy of £800,000. The clergy were mulcted in 10 per cent. of their income by this pillar of the Church.

The great redeeming trait of his character was his patronage of learning. He devoted his funds liberally to the promoting of literature. He built a college at Ipswich, endowed seven lectureships at Oxford, and had commenced building Christ Church in that city when he died.

He was charged with breaking the law of Præmunire by receiving bulls and other papal documents from Rome.

QUESTION VIII.—Show by a genealogical table who were the possible claimants to the throne in the event of the death of Queen Elizabeth shortly after her accession.



N.B.—The posterity of Frances Brandon, Duchess of Suffolk, was named by the will of Henry VIII. as the next successors to the throne, and by the party opposed to the Queen of Scots held to be the heirs presumptive.

QUESTION IX.—Both the Royalist and Parliamentary parties in the Civil War suffered from internal dissensions. Give some account of these, and say what causes contributed to the final triumph of the Parliament.

The Royalist army suffered from internal dissension from the outbreak of the war to its close. Charles was nominally commander-in-chief, but he relied chiefly on the Earl of Lindsay, an experienced warrior. The latter, however, was so disgusted with the insolence of the fiery Rupert, that he gave himself no further trouble than to command his own regiment. Rupert was undoubtedly brave, but bravery was the common trait of Cavalier and Roundhead. His impetuosity gave the advantage to the Parliamentarians at Edgehill, Marston Moor and Naseby. He ravaged the country and alienated many from the king's cause in so doing. The Royalist Camp resembled a court in that it was full of cabals, intrigues, plots, and counter-plots. Charles could not control his officers. When Bristol fell he dismissed Rupert, only to see himself compelled to reinstate him. The king had nothing but empty titles to confer upon his officers and in their jealousies and heartburnings they decried each other.

The Parliamentary army suffered in like manner. Essex, after the capture of Reading, might have invested Oxford, and thus closed the war at once. He was urged to do so. His dilatoriness saved Charles. He allowed Waller to fight alone at Roundway Down, and Waller retaliated by holding aloof at Newbury. Cromwell chafed at the slow movements and blind meanderings of Manchester, and they were constantly in dispute. These bickerings led to the Self-denying Ordinance. The aristocratic leaders who were not desirous of pushing the king too far were deprived of their commands, and the military genius of Cromwell shone forth. To the Self-denying Ordinance, to the defeat of Montrose at Philiphaugh, to the co-operation of the Scots, and to the capture of the King's Cabinet at Naseby, exposing as it did the fatal double dealing of the king, are to be attributed the final triumph of Parliament.

QUESTION X.—What was England's interest in the War of the Spanish Succession? How was the war ended?

One would think that it mattered little to Englishmen whether an Austrian or a Frenchman occupied the Spanish throne. But in reality there were much wider issues at stake. Louis XIV. made no secret of his dislike to the Revolution of 1688, and of his intention, if successful in the War of the Spanish Succession, of forcing England to restore the Stuarts. Again, the juncture of the French and Spanish crowns meant that Louis would hold Spain, the Spanish Netherlands, the Indies, and Sicily, and thus imperil our supremacy on the water. We were fighting for National freedom.

By 1710 this country was weary of the taxation incurred by the war. The Whigs were replaced by the Tories. Harley and St. John secretly sent a messenger to Louis to ask if he would agree to peace. He did, and took advantage of England's eagerness. By the Treaty of Utrecht, 1713, he agreed to recognise Anne and the Protestant succession. Philip of Anjou was allowed to keep Spain on condition that the French and Spanish crowns should never be united.

QUESTION XI.—State briefly the terms of the Act of Union with Scotland. What circumstances induced the Scottish Parliament to pass the Act?

1. That the succession should be vested in the Princess Sophia and her heirs, being Protestants.

2. Both nations should have freedom of trade and enjoy equal rights and privileges.

3. Scotland should retain the Presbyterian Church, her own laws, and her own courts of justice.

4. There should be one Parliament.

5. Scotland should be represented by 16 peers and 45 commoners.

6. Regulations of trade excise and custom to be same; Scotland to pay $\frac{1}{10}$ of land-tax paid in England.

Previous to this Act Scottish trade was greatly fettered by Parliament at the instigation of the merchants of our seaport towns. The Scotch were not allowed to trade with any country belonging to England, or with England in anything but what was made or grown in Scotland. Thus the hands of the Scots were tied by English greed. They were also afraid of English interference in matters of religion. Non-interference in these, and freedom of trade were the two great factors in dispelling Scottish Prejudice.

QUESTION XII.—How came England and France to be opposed (1) at Dettingen (2) at Fontenoy? Describe one of these battles.

When Charles VI. of Austria died there was a scramble on the part of France, Prussia, Bavaria, and other states for his possessions.

This was in direct defiance to the assent they had given to the Pragmatic Sanction. England and Holland loyally stood by Maria Theresa. In 1743 the British and Hanoverian army, under the command of George II., found their way blocked by a French army. Their supply of provisions became so scanty that it was determined to make an effort to break the French lines at Dettingen. The French were posted on the far side of a swamp. Their leader, in his eagerness for an engagement, crossed it and charged the allied army. His troops broke through the first three lines, but was met with such a deadly fire of musketry by the fourth that they fell back in disorder. The Allies advanced and swept them from the field.

In 1744 France once more espoused the Stuart Cause and made an effort to land troops on the English coast. A storm scattered the invading fleet. A declaration of war between the two countries followed. The war was chiefly waged in Flanders, and its greatest battle was fought at Fontenoy, 1745, when the Duke of Cumberland was defeated by Marshal Saxe.

QUESTION XIII.—What do you know of the Reform of the Calendar, the King's Friends and the No Popery Riots?

(*a*) The timekeeping of the world had gone too slow. To rectify matters eleven days were omitted in the year 1752, September 3rd being reckoned as the 14th. Pope Gregory had introduced this alteration in Italy as far back as 1582.

(*b*) George III., day by day in 1762 and 1763, scrutinised the voting-list of the two Houses, and distributed preferment or cashiering accordingly as members voted as he wished or not. Those members who professed to perform his behests were called *The King's Friends*.

(*c*) In 1780 the penal laws enforced against the Catholics were repealed. Ultra-Protestants were deeply vexed with the change. In London, a mob numbering some 50,000, under a half-witted nobleman, Lord George Gordon, held London for a week. Catholics were pillaged. Newgate was burned down and the City was fired in a score of places. To escape the vengeance of the mob, citizens were compelled to chalk the words 'No Popery' over their doors, and wear a blue cockade. At length the king took strong measures for suppressing the riot. The mob were shot down in the streets. Gordon was thrown into the Tower, and the other ringleaders tried and put to death.

QUESTION XIV.—Name the chief English Writers of the period of Queen Anne, and give a short account of the life and work of one of them.

In 1795 the Dutch declared their country a free republic under the protection of France; England immediately went to war with them. Dutch ships and colonies were seized. A considerable force was sent out to capture Cape Colony, and succeeded in the attempt. Early in 1796 Ceylon was captured. The Cape was very impolitically returned to the Dutch by the Treaty of Amiens, 1802, but was again captured in 1806, and has been retained ever since.

Jamaica was captured in 1655 by an expedition under Venables and Penn, but was so little appreciated at the time, that the two admirals were thrown into the Tower for the failure of a previous attempt on Cuba.

Malta was captured by Bonaparte in 1798, whilst on his way to Egypt. It was wrested from the French by the English and Maltese in 1800, the latter ceding it to the former.

Bombay was given to Charles II. by the Portuguese on his marriage with Catherine of Braganza as portion of her dowry.

Gibraltar was taken from the Spaniards during the War of the Spanish Succession by Admiral Sir George Rooke in 1704. Ten days before Blenheim was fought he landed 3,000 sailors and marines, and captured the rock with little difficulty.

QUESTION XV.—Name the chief English writers of the reign of Queen Anne. Give a brief life of one, and an account of one of his works.

The chief writers of this period were Pope, Addison, Berkeley, Defoe, Swift, and Steele.

The first was a poet, the last five chiefly confined themselves to prose literature.

Alexander Pope was born in London in the year 1688. Little is known of his parentage, as he was always more willing to show what his father was not than what he was. It is supposed that he was a linen-draper. From his birth Pope was of a delicate constitution, and his physical weakness continued through life. He was deformed, either naturally or from distortion of his feeble frame. He has been described as protuberant, behind and before. At the age of eight his education was entrusted to a Romish priest, who taught him the Greek and Latin rudiments. Before he was twelve he had been at two schools and under another priest. Getting tired of such external help, he formed a plan of private study, which he successfully carried out. Already 'he lisp'd in numbers,' and possessed a fair critic in the person of his father. At the age of 23 he wrote his 'Essay on Criticism,' which at once placed him in the front rank of writers. The following year saw the first cast of his 'Rape of the Lock.' His translations of the 'Iliad' and 'Odyssey,' brought him additional fame, and what was perhaps more welcome—competence. In the 'Dunciad' he held up to ridicule the party hacks and petty scribblers who annoyed him. His 'Essay on Man' appeared in 1742. Two years later he died. In temperament he was fretful and irascible. His reputation brought him many invitations; but he was always a troublesome guest. This may rightly be attributed to his life-long sickness. Like Moore 'he dearly loved a lord,' but never stooped to gain their notice by servility.

The 'Rape of the Lock' appeared in 1712. It is the most exquisite example of ludicrous poetry in the English language. Johnson describes it as 'the most airy, the most ingenious, and the most delightful of all his compositions.' It was occasioned by a frolic of gallantry, in which a lord cuts off a lock of hair from the head of a lady. Whether the act was one of stealth or violence it was very much resented, and very much strained the friendly relations of the two families. Pope was requested to write a ludicrous poem on the event, in the hope that it might effect a reconciliation. Whether it did so or not is a matter of doubt. Pope saw that it was capable of improvement, and imparted his scheme to Addison, who said it was 'a delicious little thing,' and gave him no encouragement. Pope, however, was confident of his ability to improve it, and the attempt was justified by its success.

SECOND YEAR.

Composition.

WOMEN CANDIDATES.

1. Write a short essay on the following theme:—

The increasing use of English as a spoken language in various parts of the world.

I. Every true lover of his country is a lover of its language also. His mother-tongue will always remain dear to him, and he will teach it, even in far off lands, to his children and children's children. So tenaciously are we bound to our native language, that the last and extremest sign of foreign domination is the extinction of the indigenous speech.

However, England has not for hundreds of years lain under the proud foot of a conqueror, but on the contrary has extended its empire to that India which Alexander vainly tried to possess, and to New World regions that Cæsar never knew.

Moreover, the vitality of English has corresponded with the enterprise of Englishmen. Wherever the English language obtains a footing, it secures a permanent position through its utility and its power of absorbing words without compromising its structure.

It furnishes the language of commerce along the coasts of China, and reigns surpreme over the vast continent of North America.

> It sounds o'er Borneo's camphor groves
> O'er seas of fierce Malay,
> Through fields which curb old Ganges' flood
> And towers of proud Bombay.
> It wakes up Aden's flashing eyes,
> Dark-brown and sinewy limbs,
> The dark Liberian soothes her child
> With English cradle hymns.

The sun never shines without illuminating lands where English is spoken.

2. Paraphrase this passage, and explain the relation in which it stands to the rest of the play:—

> England we love; and for that England's sake
> With burden of our armour here we sweat:
> This toil of ours should be a work of thine;
> But thou from loving England art so far,
> That thou hast underwrought his lawful king,
> Cut off the sequence of posterity,
> Outfaced infant state, and done a rape
> Upon the maiden virtue of the crown.
> Look here upon thy brother Geoffrey's face:—
> These eyes, these brows were moulded out of his,
> This little abstract doth contain that large,
> Which died in Geoffrey; and the hand of time
> Shall draw this brief into as huge a volume,
> That Geoffrey was thy elder brother born.
> And this his son: England was Geoffrey's right
> And this is Geoffrey's, in the name of God.
> How comes it then that thou art called a king,
> When living blood doth in these temples beat
> Which owe the crown that thou o'ermasterest?

II. We are England's friends, and on her behalf we have performed what should have been your duty, and are labouring here in arms. You have forsaken her cause, have intrigued against her rightful monarch, and broken the hereditary succession. You have impudently ursurped the sovereign rights of a child, and outraged the hitherto unsullied sanctity of the throne.

Look upon Prince Arthur here; he has thy brother Geoffrey's lineaments, and possesses his form and figure, which lack but increase of years to develop into his verisimilitude.

Prince Arthur is the son of your elder brother, and his claim before high Heaven is through his father greater than yours. What right, then, have you to reign whilst Arthur lives? Arthur the rightful heir to the crown you have ravished away.

3. Analyse this passage:—

'That close aspect of his
Doth show the mood of a much-troubled breast;
And I do fearfully believe, 'tis done,
What we so feared he had a charge to do.'

III.

Sentence	Kind of Sentence	Subject		Predicate		Object	
		Simple	Enlargement	Simple	Enlargement	Simple	Enlargement
A. That close aspect of his doth show the mood of a much troubled breast	Principal	aspect	that close ..... of his	doth show		mood	the..... of a much troubled breast
B. And I do fearfully believe 'tis done ..... a charge to do	Principal co-ordinate with A	I	(and)	do believe	fearfully	'tis done what we so feared..... ... charged to do	
B2. 'Tis done what we so feared he had a charge to do	Noun sent. gov. by *do believe*	it	what we so feared he had a charge to do	is done			
B2b. What we so feared he had a charge to do	Noun sent. in opposition to *it*	we		feared	so	he had a charge to do what	
B2b. β. He had a charge to do what	Noun sent. gov. by *feared*	he		had		a charge	to do what

4. Discuss the grammatical structure of the following passages, and parse the words printed in italics:—

(*a*) So *be it*, for it cannot *be but* so;
(*b*) It *likes* us well;
(*c*) *An* if thou *wert* his *mother*;
(*d*) The peace of Heaven is *theirs that* lift their swords;
(*e*) *What* means that *hand* upon that breast of thine?

IV. (*a*) The first verb is in the subjunctive-imperative, and the last sentence is adverbial. The word *cannot* is indicative, not *so called* potential mood.

be—verb, substantive, imperative, present, sing., 3rd, agrees with subj. *it*.

it—pers. pro., sing., 3rd, neut., nom., subj. to *be*.

be—verb, substant., infin., present, gov. by *cannot*.

but—adverb, modifying *so* with some negative force.

(*b*) The verb *likes* is here used impersonally or unipersonally, and governs *us* in the dative. *Likes* is from Norman *lika*, A.S. *gelican* = to please.

likes—verb, regular (weak), trans., act. verb, indic., present, sing. 3rd (unipersonal) agrees with *it* and governs *us* in dative.

(*c*) The sentence is in the subjunctive mood.

an—conjunction used redundantly. N.B.—It is an abbreviation of A.S. *and* = in Middle English *if*.

wert—verb, copulative, irreg., subjunct., present., sing., 2nd, agrees with its subj. *thou*.

(*d*) In modern English a relative pronoun seldom takes as its antec. a word with a possessive force.

theirs—possessive personal pronoun, plural, 3rd, com. gen., nom., subject after *is*.

that—rel. pro., plural, 3rd, com. gen., nom. subj. to *left* and agrees with *theirs*.

(*e*) The peculiarity of this sentence is the double expression of the possessive by the words *of thine*.

What—inter., pro., sing., 3rd, neut., obj. gov. by *means*.

hand—com. noun, sing., 3rd, neut., nom., subj. to *means*.

5. Say what is the meaning and origin of the following words, and how Shakespeare uses them:—Regreet, Rheum, Commodity, Harbourage, Beholden, Aweless, Mutines, Indirection, Canonized, Enfranchisement, Welkin.

V. (*a*) *Regreet* = greeting or saluting.

'And shall these hands, so lately purged of blood
So newly joined in love, so strong in both,
Unyoke this seizure and this kind *regreet*?'—(III. 1. 241.)

Properly the word means greeting again or in return, from L. re = back, again, and A.S. *gretan* = to greet. It is thus a hybrid formation.

(*b*) *Rheum* = tears or some flowing liquid, from Gr. *rheuma*, a flow.

'Why holds thine eye that lamentable *rheum*?'—(III. 1. 20.)

'How now foolish *rheum*,
Turning dispiteous torture out of door.'—(IV. 1. 32.)

(*c*) *Commodity* = convenience, from L. *con.* = together, modus = measure.

'Kings break faith upon *commodity*.'—(II. 1. 597.)
See also lines 573, 574, 578, 581, 587.

(*d*) *Harbourage* = shelter, from A.S. *here* = an army, and *beorgan* = to shelter.

'Crave *harbourage* within your city walls.'—(II. 1. 237.)

(*e*) *Aweless* = fearless, from A.S. *eg* = fear.

'The *aweless* liar could not wage the fight.'—(I. 1. 266.)

(*f*) *Mutines* = Mutineers, from FR. *mutin* = turbulent, *mutiner* = to revolt.

'Do like the *mutines* of Jerusalem,
Be friends awhile.'—(II. 1. 378.)

(*g*) *Indirection* = injustice, from L. *in* = not, *directus* = made straight.

'Yet *indirection* thereby grows direct.'—(III. 1. 276.)

(*h*) *Beholden* = indebted, from A.S. *be* (intensive), and *healdan* = to observe.

'To whom am I *beholding* for these limbs?'—(I. 1. 239.)

(*i*) *Canonized* = made a saint, from GR. *kanon* = ruler, L. *canon* = rule.

'*Canonized* and worshipped as a saint.'—(III. 1. 177)

(*j*) *Enfranchisement* = setting at liberty, from *en* = in, and Fr. *franc* = free.

'[I] heartily request
The *enfranchisement* of Arthur.'—(IV. 11. 52.)

(*k*) *Welkin* = the sky, from A.S. *wolcnu* = clouds, Middle English, *welkne*.

'Rattle the *welkin's* ear.'—(V. 11. 172.)

['The sun] made the western *welkin* blush.'—(V. v. 2.)

6. Summarise, in your own words, the contents of Act IV., Scene 2 (in which the king meets the peers after the death of Arthur).

VI. [N.B.—This is a most carelessly set question, for Arthur's death is not depicted until the following scene, in which Pembroke and Salisbury find his corpse.]

King John, Pembroke, Salisbury, and other lords are in King John's palace, discoursing about his second [English] coronation, and Pembroke, supported by his fellows, seizes the opportunity to plead with the king for Arthur's liberation. John has just granted their request, when Hubert enters, and, whilst the lords are among themselves regarding him as an assassin, privately and falsely informs the king that Arthur is dead. This information is at once imparted to them, and burning with indignation they depart. Almost immediately a messenger arrives and informs the king that Constance had died three days previously, but that the French are gathering 'never such a power' for invading England. The Bastard now enters with Peter of Pomfret, who had prophesied the deposition of John. Him, the king orders Hubert to imprison and execute; and sends off the Bastard to endeavour to effect a reconciliation with the lords; Hubert now re-enters and depicts the excitement of the country at Arthur's death. John passionately reproaches Hubert for acting upon the 'winking of authority,' and orders him out of his presence. Thereupon Hubert informs the king that young Arthur is still alive; and is bade to hasten to the peers and bring back to his closet the angry lords.

7. Sketch, with the help of illustrative quotations, the character of either King John or of Constance; with special reference both to dramatic consistency and to historical truth.

VII. (*a*) CHARACTER OF KING JOHN.

This monarch, as he stands in authentic history, was such a compound of extortion, treachery, meanness, irresolution, cowardice, cruelty, and cunning that had not Shakespeare with consummate art allowed John's character to reveal itself, instead of more directly picturing it, the delineation would have been adjudged a caricature or lampoon.

(1) *Extortion.*

'See thou shake the bags
Of hoarding abbots * * * * * *
Use our commission in its utmost force.'
—(III. III. 7-11.)

(2) *Treachery.*

'I faintly broke with thee of Arthur's death;
And thou to be endeared to a king,
Made it no conscience to destroy a prince?'
—(IV. II. 227-229.)

(3) *Meanness.*

'By heaven, Hubert, I am almost ashamed
To say what good respect I have of thee.'
—(III. III. 27, 28.)

'The legate of the Pope hath been with me,
And I have made a happy peace with him.'
—(V. I. 62, 63.)

(4) *Irresolution.*

'No Italian priest
Shall tithe or toll in our dominions.'
—(III. I. 153, 154.)

'Thus have I yielded up into your [Pandulf, the Pope's legate] hand
The circle of my glory.'—(V. I. 1 and 2.)

(5) *Cowardice.*

'Thou hast made me giddy
With these ill tidings.'—(IV. II. 131, 132.)

K. John. How goes the day with us? O, tell me, Hubert.
Hubert. Badly, I fear. How fares your majesty?
K. John. This fever, that has troubled me so long,
Lies heavy on me; O, my heart is sick!—(V. III. 1-4.)

It is only fair to add that some writers dispute John's cowardice.

(6) *Cruelty.*

'On that day at noon, whereon he says
I shall yield up my crown, let him be hanged.'
—(IV. II. 156, 157.)

(7) *Cunning.*

'Gentle kinsman, go,
And thrust thyself into their companies:
I have a way to win their loves again.'
—(IV. II. 166-168.)

8. Reproduce, and give in words the argument of *one* of these Essays of Bacon:—*Nobility, Atheism, Friendship, Studies.*

VIII. See answer to Question VI.—Men Candidates, First Year.

9. Say in what connection these passages stand, and what part they respectively play, in Bacon's argument:—

(*a*) The surest way to prevent seditions is to take away the matter of them;

(*b*) Let Diaries be brought in use;

(*c*) Time is the greatest innovator;

(*d*) All warlike people are a little idle, and love danger better than travail;

(*e*) Nature is often hidden, sometimes overcome, seldom extinguished.

IX. (*a*) 'Concerning the materials of Seditions, it is a thing well to be considered; for *the surest way to prevent Seditions* (if the times do bear it) *is to take away the matter of them.*' (Of Seditions and Troubles.)

Bacon is arguing that material prosperity produces contentment, and that 'poverty and broken estate in the better sort, joined with want and necessity in the meaner sort, render the danger imminent and great.'

(*b*) 'In land travel, wherein so much is to be observed, *let diaries be brought in use.*' (Of Travel.)

Diaries should be used to record observations and ideas more than mere occurrences.

(*c*) 'He that will apply new remedies must expect new evils; for *Time is the greatest Innovator.*' (Of Innovations.)

People must not expect unmixed good from Changes, and Time itself of necessity works changes which sometimes are evil.

(*d*) 'It is certain that sedentary and within-door arts, and delicate manufactures (that require rather the finger than the arm) have in their nature a contrariety to a military disposition; and generally *all warlike people are a little idle, and love danger better than travail;* neither must they be too much broken of it, if they shall be preserved in vigour.' (Of true greatness of kingdoms and estates.)

Our author is arguing that sedentary occupations tend not to national greatness, and that a drudging industry provides not warlike material.

(*e*) '*Nature is often hidden, sometimes overcome, seldom extinguished.*' Force maketh Nature more violently in return, doctrine and discourse maketh Nature less importune; but custom alone doth alter and subdue Nature.' (Of Nature in Men.)

Bacon asserts that we may slowly train, restrain, or overlay Nature, but that we cannot eradicate or coerce her, as far as men's dispositions are concerned.

10. Give an account of your own impressions after reading either (*a*) the play of King John, or (*b*) Bacon's Essays, with special reference to the style, and to the writer's use of language.

X. (*a*) The most striking feature in King John must be the comparative absence of humour, although here and there are quaint touches, and the character of Faulconbridge is distinctly amusing

The drama, though not generally accounted a tragedy, is distinctly tragic, and affords splendidly utilised opportunity for pathetic delineation: the grief of Constance, and the pleading of Arthur with Hubert are inimitable.

The master character of the play is Constance. Our poet seldom conceived a finer character. Her affection, her courage, her queenly dignity are finely portrayed, although in some of her speeches there is a redundancy of rhetoric and verbal ingenuity which springs more from the elaborate artificiality born of ambition than from inspiration.

This is a defect which marks the workmanship of Shakespeare's earlier writings.

Besides this flaw in the language, there are other passages which do not rise to the general level, many of which Shakespeare took almost verbatim from an anonymous old play entitled '*The Troublesome Riagne of John, King of England.*'

(*b*) THE ESSAYS OF BACON are as full of matter as an egg is of meat. It is plain to everyone that the writer had a well-digested and deeply thought-out plan from which he was not enticed to depart. A book more full of the true wisdom of the world, gathered from official experience, travel, and profound scholarship and philosophy, cannot be found. Bacon, as his *antitheta* show, could see two sides of the question, and had the faculty of expressing them, without parodoxes, in weighty, terse, and dignified words. Our author does not seem to be enforcing his own views, but to be enunciating wise maxims with the gravity of a judge and dignified authority of a legislator.

The vocabulary employed is, of course, very similar to that of other learned authors of his period, but is somewhat more archaic and classical in origin. He is singularly free from hybrid words (using such forms as *in*fortunate); and appears instinctively to avoid ephemeral ones. A few of his words used agglutinately, such as *maybe*, *aswell*, are not now used as compounds.

II. How far is Shakespeare's representation of the life and character of King John true to history? Point out any scenes or characters which the dramatist has invented, and any anachronisms which you have met with in reading the play.

XI. (*a*) On the whole Shakespeare's portrayal of the character and life of King John are fairly consistent with historical truth. Many anachronisms, condensations, and inventions there undoubtedly are; but the most important of these are not in connection with the king, and many of them are needful to heighten dramatic effect.

The chief deviation from historical accuracy is the setting forth of the real or reputed murder of Arthur as the main cause of the troubles which distracted the latter part of John's reign, and ended only with his life. The truth is that the treatment of Arthur was but one act in a life-long course of cruelty, cowardice, lust and perfidy.

It should be, moreover, noted that the principle of primogeniture was not so well established at that period as Shakespeare represented it to be.

(*b*) The chief characters invented are Philip the Bastard, and Lymoges, Duke of Austria. The fictitious scenes are part of Act I., scene I.; Act III., scene II.; Act IV., scene I.; Act IV., scene III.; Act V., scene I., and Act V., scene VII.

(*c*) *Anachronisms*:—

(1) *Use of cannon*, bullets, etc. (I. I. 26, II. I. 210, 227, V. v. 5, etc.).
(2) *A half-faced groat* was not coined until Henry VII. (I. I. 94).
(3) *Three farthings*, coined in Elizabeth' reign (I. I. 143).
(4) *Bedlam* or Bethlehem. The priory was only founded in 1247, and not converted into a lunatic asylum until 300 years later (II. I. 183).
(5) *Dauphin*, this title was not used until the 14th century (II. I. 425).
(6) *Angel*, coined first in Edward IV.'s reign (II. I. 590, V. II. 64).
(7) *Armada*, alluding to the Spanish Armada of Elizabeth's reign (III. IV. 2).
(8) *Arras* is first mentioned in 1397 (IV. I. 2).
(9) *Cards*, introduced in the time of Charles VI. of France, who ascended the throne in 1380.

There are in addition historical errors of anticipation such as introducing disputes about the Papal Supremacy and Sale of Indulgence (III. I. 152—171).

FIRST YEAR.

Algebra and Mensuration.

MALE CANDIDATES.

Question 1.—Prove that $a-(b-c)=a-b+c$.

If $x^2+y^2+z^2=1$, prove that

$(x+y+z)^2=(1+y-z)(1+z-y)+(1+z-x)(1+x-z)+(1+x-y)(1+y-x)$.

(1) *a*. $a-(b-c)$ means that from 'a' we are to subtract the excess of b over c:—If from a we subtract 'b' we shall have taken away c too much, and must therefore add c to $a-b$.

$\therefore a-(b-c)=a-b+c$.

Q. E. D.

β. $(1+y-z)(1+z-y)+(1+z-x)(1+x-z)+(1+x-y)(1+y-x)=$

$=1-y^2+z^2+2zy+1-z^2-x^2+2xz+1-x^2-y^2+2xy$

$=x^2+2xy+y^2+2xz+z^2+2xy$.

$=x^2+y^2+z^2+2xy+2xz+2xyz$.

which is the expansion of

$(x+y+z)^2$.

Q. E. D.

Question 2.—Assuming the rule for finding the greatest common measure of two expressions, show how to find it for three expressions.

Find G.C.M. of

$343\,p^3q^2r\,(3x^4-11x^3+7x^2-4x+3)$ and $441\,p\,q^2r^3\,(4x^4-15x^3+11x^2-7x+3)$.

(2) Let A B and C be three quantities, and let F be G.C.M. of A and B, and let G be the G.C.M. of F and C;

Then G shall be C.C.M. of A, B, and C.

Proof.—F contains every factor common to A and B (hyp.), and G contains every factor common to F and C. $\therefore$ G contains every factor common to A B and C. $\therefore$ G is G.C.M. of A B and C.

Question 2, *part* 2.—

	$3x^4-11x^3+7x^2-4x+3$	$4x^4-15x^3+11x^2-7x+3$	
$-3x$	$3x^4-15x^3+15x^2+9x$	3	
	$4x^3-8x^2-13x+3$	$12x^4-45x^3+33x^2-21x+9$	4
-4	$4x^3-20x^2+20x+12$	$12x^4-44x^3+28x^2-16x+12$	
	$3\mid 12x^2-33x-9$	$-x^3+5x^2-5x-3$	
	$4x^2-11x-3$	-4	
$4x$	$4x^2-12x$	$4x^3-20x^2+20x+12$	
	$x-3$	$4x^3-11x^2-3x$	x
1	$x-3$	$-9x^2+23x+12$	
	$\ldots$	-4	
		$36x^2-92x-48$	9
		$36x^2-99x-27$	
		$7\mid 7x-21$	
		$x-3$	

$\therefore$ G.C.M. of $(3x^4-11x^3+7x^2-4x+3)$ and $(4x^4-15x^3+11x^2-7x+3)=(x-3)$.

G.C.M. of p^3q^2r and $p\,q^2r^3=p\,q^2r$.

$343=7\times49$, $441=9\times49$.

$\therefore$ G.C.M. of 343 and $441=49$.

$\therefore$ G.C.M. required $=\underline{49\,p\,q^2r\,(x-3)}$. Ans.

Question 3. Simplify—(1) $\left\{(a^{\frac{3}{2}}a^{\frac{1}{2}}\div a^{\frac{1}{6}})^2\right\}^3$

(2) $\dfrac{x^2-16y^2}{x^2-xy-12y^2}\times\dfrac{x^2-9y^2}{x^2+xy-12y^2}$ (3) $\dfrac{a-7a^{\frac{1}{2}}}{a-5\sqrt{a}-14}\times\dfrac{}{\left(1+\frac{2}{\sqrt{a}}\right)^{-1}}$

(1) $\left\{(a^{\frac{3}{2}}a^{\frac{1}{2}}\div a^{\frac{1}{6}})^2\right\}^3=\left\{(a^{\frac{3}{2}+\frac{1}{2}-\frac{1}{6}})^2\right\}^3=\left\{(a^{\frac{4+3-1}{6}})^2\right\}^3$

$=\left\{a^2\right\}^3=a^6$.

Q. E. F.

(2) $\frac{x^2-16y^2}{x^2-xy-12y^2} \times \frac{x^2-9y^2}{x^2+xy-12y^2}$

$= \frac{(x-4y)(x+4y)}{(x-4y)(x+3y)} \times \frac{(x-3y)(x+3y)}{(x+4y)(x-3y)}$

$= \frac{x+4y}{x+3y} \times \frac{x+3y}{x+4y} = 1.$

Q. E. F.

(3) $\frac{a-7a^{\frac{1}{2}}}{a-5\sqrt{a}-14} \div \left(1+\frac{2}{\sqrt{a}}\right)^{-1}$

$= \frac{a^{\frac{1}{2}}(a^{\frac{1}{2}}-7)}{(a^{\frac{1}{2}}-7)(a^{\frac{1}{2}}+2)} \times \frac{\sqrt{a}+2}{\sqrt{a}}$

$= \frac{a^{\frac{1}{2}}}{a^{\frac{1}{2}}+2} \times \frac{a^{\frac{1}{2}}+2}{a^{\frac{1}{2}}} = 1.$

Q. E. F.

Question 4.—(*a*) Prove that the square root of a rational quantity cannot be partly rational and partly surd.

(*b*) Simplify $\sqrt[3]{135} - \frac{1}{2}\sqrt[3]{320} + \frac{1}{3}\sqrt[3]{1080}$.

(*a*) *Proof.*—If possible let $\sqrt{n} = a + \sqrt{m}$ where $\sqrt{m}$ is a surd

$\therefore$ squaring, $n = a^2 + m + 2a\sqrt{m}$

$$\therefore \sqrt{m} = \frac{n-a^2-m}{2a}$$

that is, a surd is equal to a rational quantity, which is impossible. $\therefore$ the square root of a rational quantity cannot be partly rational and partly surd.

(*b*) $\sqrt[3]{135} - \frac{1}{2}\sqrt[3]{320} + \frac{1}{3}\sqrt[3]{1080}$

$= \sqrt[3]{27 \times 5} - \frac{1}{2}\sqrt[3]{64 \times 5} + \frac{1}{3}\sqrt[3]{216 \times 5}$

$= \sqrt[3]{3^3 \times 5} - \frac{1}{2}\sqrt[3]{4^3 \times 5} + \frac{1}{3}\sqrt[3]{6^3 \times 5}$

$= 3\sqrt[3]{5} - 2\sqrt[3]{5} + 2\sqrt[3]{5} = 3\sqrt[3]{5}$. Ans.

Question 5.—Solve the equations:

(1) $\begin{cases} \frac{x}{2}+\frac{2}{y}=\frac{5}{4} \ldots (1) \\ \frac{x}{3}+\frac{3}{y}=\frac{5}{3} \ldots (2) \end{cases} \therefore \begin{cases} \frac{2}{y}=\frac{5-2x}{4} \ldots (3) \\ \frac{3}{y}=\frac{5-3x}{3} \ldots (4) \end{cases}$

Multiplying across $8 = 5y - 2xy \ldots . (5)$

$9 = 5y - 3xy \ldots . (6)$

Subtract 5 from 6 $\therefore xy = 1$ subs. in (5)

$8 = 5y - 2 \therefore 5y = 10 \therefore y = 2$ and $xy = 1 \therefore 2x = 1 \therefore x = \frac{1}{2}$ } Answer.

(2) $\frac{3x-2}{2x-5} - \frac{2x-3}{3x-2} = \frac{2}{3}$

$\therefore$ Multiplying across $3(3x-2)^2 - 3(2x-3)(2x-5) = 2(2x-5)(3x-2)$

Expanding $3(9x^2-12x+4) - 3(4x^2-16x+15) = 2(6x^2-19x+10)$

$\therefore 27x^2 - 36x + 12 - 12x^2 + 48x - 45 = 12x^2 - 38x + 20$

$\therefore 3x^2 + 50x - 53 = 0$

$\therefore (x-1)(3x+53) = 0 \therefore x = 1$ or $-\frac{53}{3}$. Ans.

(3) $\begin{cases} x^2(y+1) + y^2(x+1) = 19 \ldots . (1) \\ xy + 6 = 0 \ldots \ldots \ldots \ldots (2) \end{cases}$

rewriting (1) $x^2 + y^2 + xy(x+y) = 19$

adding 2 xy and substituting with (2)

$\therefore (x^2 + 2xy + y^2) - 6(x+y) = 7 \ldots . (3)$

$\therefore (x+y)^2 - 6(x+y) - 7 = 0$. Let $p = x + y \ldots . (4)$

$\therefore p^2 - 6p - 7 = 0 \therefore (p-7)(p+1) = 0 \therefore p = 7$ or -1

$\therefore$ (5) $x + y = 7$ or -1 }
(2) $xy = -6$ } combining (5) and (2) we obtain

$x(7-x) = -6$; or $x(-1-x) = -6$

$\therefore x^2 + x - 6 = 0$ and $x^2 - 7x - 6 = 0$

$\therefore (x+3)(x-2) = 0$ and $x = \frac{7 \pm \sqrt{49+24}}{2}$

$x = 2$ or -3 and $xy = -6$ $\qquad x = \frac{7 \pm \sqrt{73}}{2}$

$\therefore y = -3$ or 2 and $y = \frac{-10}{7 \pm \sqrt{73}}$

$\therefore x = 2, -3$, or $\frac{7 \pm \sqrt{73}}{2}$
$y = -3$ or $\frac{-12}{7 \pm \sqrt{73}}$ } Surd values are inadmissible.

Question 6.—On a road the number of telegraph posts per mile is such that if there were one fewer in each mile the space between each would be increased by $2\frac{4}{15}$ yards. Find number of posts per mile.

Let x = number $\therefore \frac{1760}{x}$ = yards apart,

$\frac{1760}{x-1}$ = yards apart with 1 less per mile,

$\therefore \frac{1760}{x-1} - \frac{1760}{x} = 2\frac{4}{15} = \frac{34}{15}$.

$\therefore 1760 \times 15(x - x + 1) = 44(x-1)x$.

$\therefore 600 = x(x-1)$.

$x^2 - x - 600 = 0 \therefore (x-25)(x+24) = 0$

$\therefore x = 25$ or $-24 \therefore$ number of posts = 25. Ans.

Question 7.—A ratio of greater inequality is diminished by adding same quantity to both terms. If $a : b :: c : d$ prove that $a : a + c :: a + b : a + b + c + d$.

Part 1.

Let $\frac{a}{b}$ be a ratio of greater inequality.

Add x to each term $\therefore \frac{a}{b} - \frac{a+x}{b+x} = \frac{x(a-b)}{b(b+x)}$

But $a > b$ (hyp.) $\therefore a - b$ is positive,

$\therefore \frac{x(a-b)}{b(b+x)}$ and $\frac{a}{b} - \frac{a+x}{b+x}$ are positive

$\therefore \frac{a}{b}$ is $>$ than $\frac{a+x}{b+x} \therefore$ a ratio, etc.

Q. E. D.

Part 2.

$\frac{a}{b} = \frac{c}{d} \therefore$ (alt.) $\frac{a}{c} = \frac{b}{d} = \frac{a+b}{c+d}$ (sum of num. and denom.)

$\therefore \frac{a}{c} = \frac{a+b}{c+d}$

$\therefore$ invertendo $\frac{c}{a} = \frac{c+d}{a+b}$

$\therefore \frac{c+a}{a} = \frac{a+b+c+d}{a+b}$ (componendo)

$\therefore$ invertendo $a : a + c :: a + b : a + b + c + d$.

Q. E. D.

Question 8.—A hare is 72 of its leaps before a greyhound and takes 9 leaps to his 5; but 3 of the greyhound's leaps are equal to 7 of hare. How many leaps will the hare make before it is caught?

Let x = number of leaps hare makes, besides the 72.

$\therefore x + 72$ = number of hare's leaps dog makes,

$\therefore \frac{(x+72)3}{7}$ = number of leaps dog makes,

$\therefore \frac{x}{\frac{(x+72)3}{7}} = \frac{9}{5} \therefore 5x = \frac{27(x+72)}{7}$

$\therefore 35x = 27x + 1944$.

$\therefore 8x = 1944 \therefore x = 243$ leaps. Ans.

Question 9.—If S_n denotes sum of n terms of a G.P., of which first term is a and common ratio r, find S_n, and show that $S_n = (1+r)S_{n-1} - rS_{n-2}$

(A) $S_n = a + ar + ar^2 + \ldots . + ar^{n-1}$

$rS_n = ar + ar^2 + ar^3 + \ldots . + ar^n$

$\therefore S_n(1-r) = a - ar^n = a(1-r^n)$,

$\therefore S_n = \frac{a(1-r^n)}{1-r}$. Ans.

(B) $S_n = a + ar + \ldots + ar^{n-1}$
$= S_{n-1} + ar^{n-1}$
$= (1 + r) S_{n-1} + ar^{n-1} - r S_{n-1}$
$= (1 + r) S_{n-1} + ar^{n-1} - r(a + ar + \ldots ar^{n-2})$
$= (1 + r) S_{n-1} + ar^{n-1} - r S_{n-2} - ar^{n-1}$
$= (1 + r) S_{n-1} - r S_{n-2}$

Q. E. D.

Question 10.—Find harmonic mean between two given quantities.

If a, b, c, d are in H.P., show that as $ad : bc :: a + d : b + c$.

(A) Let a and b be two quantities and x harmonic mean

$\therefore \frac{a}{b} = \frac{a - x}{x - b}$ $\therefore -ab + ax = ab - bx$

$\therefore x(a + b) = 2ab$

$\therefore x = \frac{2ab}{a + b}$ Q. E. D.

(B) a, b, c, d are in H.P.

$\therefore \frac{1}{a}, \frac{1}{b}, \frac{1}{c}, \frac{1}{d}$ are in A. P.

$\therefore \frac{1}{d} - \frac{1}{c} = \frac{1}{b} - \frac{1}{a}$ $\therefore \frac{1}{d} + \frac{1}{a} = \frac{1}{b} + \frac{1}{c}$

$\therefore \frac{a + d}{ad} = \frac{b + c}{bc}$

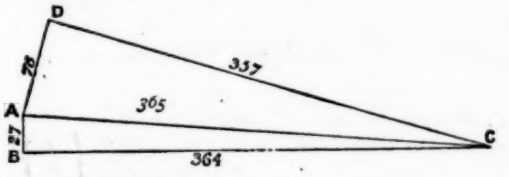
Altern. $\frac{a + d}{b + c} = \frac{ad}{bc}$

$\therefore ad : bc :: a + d : b + c$.

Q. E. D.

Mensuration.

The sides of a field are 27, 364, 357 and 76 yards respectively, and the angle between the first two is a right angle. Find area in acres and decimal of an acre.



$AC = \sqrt{(27)^2 + (364)^2}$

$= \sqrt{133225} = 365$. In Δ ADC, $S = \frac{1}{2}(76 + 365 + 357) = 399$

area field = area Δ ABC + area Δ ADC.

$= (364 \times 27)\frac{1}{2} + \sqrt{399(399 - 76)(399 - 365)(399 - 357)}$.

$= 182 \times 27 + \sqrt{399 \times 323 \times 34 \times 42}$ square yards.

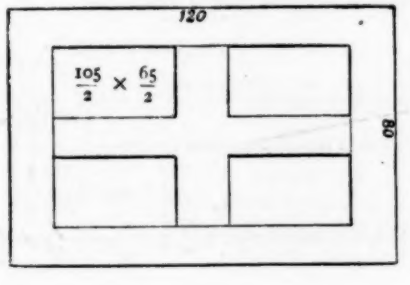
$= 4914 + \sqrt{19 \times 3 \times 7 \times 17 \times 19 \times 17 \times 2 \times 3 \times 2 \times 7}$ square yards.

$= 4914 + 19 \times 17 \times 7 \times 3 \times 2$ square yards.

$= 4914 + 13566 = 18480$ square yards.

$= \frac{18480}{4840} = \frac{42}{11} = 3\frac{9}{11} = \underline{3{\cdot}81 \text{ acres.}}$ Ans.

2. A rectangular courtyard is 120 feet long by 80 broad. Three paths are made within it, each 5 feet wide. One path is bounded by four sides of yard, one crosses it from end to end through the centre of the court parallel to length; the third crosses from side to side passing through centre parallel to breadth. Find cost of laying down remaining area with turf at 6d. per square yard. These paths divide court into four equal parts, each $(120 - 15)\frac{1}{2}$ in length, and $(80 - 15)\frac{1}{2}$ in breadth.



$\therefore$ Area of each piece $= \frac{105}{2} \times \frac{65}{2}$ square feet.

Area of whole surface to be turfed $= \frac{4}{3} \times \frac{35}{2} \times \frac{65}{2}$ sq. yds.

$= \frac{2275}{3}$ square yards.

$\therefore$ Cost $= £\frac{455}{3} \times \frac{1}{8} = £\frac{455}{24} = \underline{£18\ 10s.\ 2d.}$ Ans.

3. A circle, an equilateral Δ, and a regular hexagon each have the same perimeter, viz. 150 feet.

Compare their areas. $\left(\pi = \frac{22}{7}\right)$

(A) Area of circle $= \pi r^2$; circumference $= 2\pi r = 150$

$\therefore \pi r = 75$ $\therefore r = \frac{75 \times 7}{22}$

Area $= \left(\frac{75 \times 7}{22}\right)^2 \times \frac{22}{7} = \frac{75 \times 75 \times 7}{22}$ square feet.

(B) Area of equilateral Δ = square of half the side $\times$ by $\sqrt{3}$ but perimeter = 150, $\therefore$ side = 50.

$\therefore$ Area $= (25)^2 \times \sqrt{3}$.

(C) Area of hexagon = the square of half the side $\times$ by $\sqrt{3}$ by 6

$= \left(\frac{25}{2}\right)^2 \times \sqrt{3} \times 6 = \frac{625}{2} \times 3\sqrt{3}$

$\therefore$ Area O : area Δ : area hexagon.

$:: \frac{75 \times 75 \times 7}{22} : 25 \times 25\sqrt{3} : \frac{625}{2} \times 3\sqrt{3}$

$:: \frac{9 \times 7}{22} : \sqrt{3} : \frac{3}{2}\sqrt{3}$. (Having cancelled by 625.)

$:: 63 : 22\sqrt{3} : 33\sqrt{3}$

$:: 21\sqrt{3} : 22 : 33$.

Q. E. F.

SECOND YEAR.

Algebra and Mensuration.

MALE CANDIDATES.

Question 1.—Prove that the sum of the roots of the equation $x^2 - px + q = 0$ is p, and that their product is q.

If a, β be the roots of $\frac{h}{a - x} + \frac{k}{b - x} = 1$, $h = \frac{(a - a)(\beta - a)}{a - b}$, $k = \frac{(a - b)(\beta - b)}{b - a}$.

(A) Let α and β be roots of equation $x^2 - px + q = 0$

completing square $x^2 - px + \left(\frac{p}{2}\right)^2 = \left(\frac{p}{2}\right)^2 - q$.

taking sq. root $x - \frac{p}{2} = \frac{\pm\sqrt{p^2 - 4q}}{2}$ $\therefore x = \frac{p \pm \sqrt{p^2 - 4q}}{2}$

$\therefore \alpha = \frac{p + \sqrt{p^2 - 4q}}{2}$ and $\beta = \frac{p - \sqrt{p^2 - 4q}}{2}$

$\therefore$ sum of roots $= \alpha + \beta = \frac{p + \sqrt{p^2 - 4q} + p - \sqrt{p^2 - 4q}}{2}$

$= \frac{2p}{2} = p$. Q. E. D.

and product of roots $= \frac{p - \sqrt{p^2 - 4q}}{2} \times \frac{p + \sqrt{p^2 - 4q}}{2} =$

$\frac{p^2 - p^2 + 4q}{4} = \frac{4q}{4} = q$. Q. E. D.

(B) $\frac{h}{a - x} + \frac{k}{b - x} = 1$ $\therefore h(b - x) + k(a - x) = (a - x)(b - x)$

$\therefore hb - hx + ak - kx = x^2 - ax - bx + ab$

transposing $x^2 - (a + b - k - h)x = ab - hb - ka$.

$\therefore$ by above proof in Answer 1 A $\alpha + \beta = (a + b - h - k)$ and $\alpha\beta = (ab - hb - ka)$

$\therefore \frac{(a-a)(\beta-a)}{a-b} = \frac{a\beta - a(a+\beta)+a^2}{a-b} =$ by substitution

$$\frac{ab - hb - ka - a^2 - ab + ah + ak + a^2}{a-b}$$

$$= \frac{h(a-b)}{a-b} = h.$$ Q. E. D.

$\frac{(a-b)(\beta-b)}{b-a} = \frac{a\beta - b(a+\beta)+b^2}{b-a} =$ by substitution

$$\frac{ab - hb - ka - ab - b^2 + bh + bk + b^2}{b-a}$$

$$= \frac{k(b-a)}{b-a} = k.$$

Q. E. D.

Question 2.—Solve the equations—

(1) $\frac{2x+1}{29} + \frac{471-6x}{2} = 9 + \frac{402-3x}{12}$

$\therefore \frac{2x+1}{29} = \frac{108+402-3x-2826+36x}{12} = \frac{33x-2316}{12}$

and $\therefore \frac{2x+1}{29} = \frac{11x-772}{4}$ $\therefore 8x+4 = 319x - 2388$

also transposing $311x = 22392$

$\therefore x = 72.$ Ans.

(2) $\frac{2x-5}{x-3} + \frac{2x}{x-4} = \frac{25}{3}$

$\therefore 3(x-4)(2x-5) + 6x(x-3) = 25(x-3)(x-4)$

mulitiplying across

$3(2x^2 - 13x + 20) + 6(x^2 - 3x) = 25(x^2 - 7x + 12)$

$\therefore 6x^2 - 39x + 60 + 6x^2 - 18x = 25x^2 - 175x + 300$

transposing $13x^2 - 118x + 240 = 0$

Factorising $(x-6)(13x-40) = 0$ $\therefore x = 6$ or $\frac{40}{13}$ Ans.

(3) $\left\{ \begin{array}{l} x^3 + y^3 = 468 \quad .\ .(1) \\ x^2y + xy^2 = 420 \quad .(2) \end{array} \right.$

multiplying (2) by 3 and adding to (1) we obtain

$x^3 + 3x^2y + 3xy^2 + y^3 = 1728$ . . (3)

taking cube root $x + y = 12$ . . (4)

dividing (2) by (4) $xy = 35$ . . (5)

substituting for y in (5) its value in (4)

$\therefore x(12-x) = 35$ $\therefore x^2 - 12x + 35 = 0.$

factorising $\therefore (x-7)(x-5) = 0$ $\therefore x = 7$ or 5

$\therefore 5$ or $7y = 35$ . . (5) $\therefore y = 5$ or 7 Ans.

Question 3.—Find the square of $a^{\frac{3}{2}} - 2a^{\frac{1}{2}}b^{-\frac{1}{2}} + 3b^{-\frac{1}{2}}$,

and simplify $\frac{1}{4(1+\sqrt{x})} + \frac{1}{2(1+x)} + \frac{1}{4(1-\sqrt{x})}$

(A) $(a^{\frac{3}{2}} - 2a^{\frac{1}{2}}b^{-\frac{1}{2}} + 3b^{-\frac{1}{2}})^2 =$

$$\left\{ (a^{\frac{3}{2}} - 2a^{\frac{1}{2}}b^{-\frac{1}{2}} + b^{-\frac{1}{2}}) + 2b^{-\frac{1}{2}} \right\}^2.$$

$= (a^{\frac{1}{2}} - b^{-\frac{1}{2}})^4 + 4b^{-\frac{1}{2}}(a^{\frac{1}{2}} + b^{-\frac{1}{2}})^2 + 4b^{-\frac{2}{2}}.$

$= a^3 - 4ab^{-\frac{1}{2}} + 6a^{\frac{2}{2}}b^{-\frac{1}{2}} - 4a^{\frac{1}{2}}b^{-\frac{1}{2}} + b^{-\frac{2}{2}} +$

$4a^{\frac{2}{2}}b^{-\frac{1}{2}} - 8a^{\frac{1}{2}}b^{-\frac{1}{2}} + 4b^{-\frac{2}{2}} + 4b^{-\frac{2}{2}}$

$= a^3 - 4ab^{-\frac{1}{2}} + 10a^{\frac{2}{2}}b^{-\frac{1}{2}} - 12a^{\frac{1}{2}}b^{-\frac{1}{2}} + 9b^{-\frac{2}{2}}$

Ans.

(B) $\frac{1}{4(1+\sqrt{x})} + \frac{1}{2(1+x)} + \frac{1}{4(1-\sqrt{x})}$

$= \frac{1}{2(1+x)} + \frac{1-\sqrt{x}}{4(1-x)} + \frac{1+\sqrt{x}}{4(1-x)} = \frac{1}{2(1+x)} + \frac{1}{2(1-x)}$

$= \frac{1-x+1+x}{2(1-x^2)} = \frac{1}{1-x^2}$ Ans.

Question 4.—To insert a given number of geometric means between two given quantities.

If a, b, c, d be in geometrical progression, prove that $ax^2 + c$ divides $ax^3 + bx^2 + cx + d$ without remainder.

Let a and b be two given quantities

Let x = common ratio

there will be a G.P of $(n+2)$ terms 1st term $= a$

common ratio $= x$ last term $= b$

$\therefore$ Series $= a, ax, ax^2, \ldots, ax^{n-1}, ax^n$, and b

last term = also ax^{n+1} $\therefore b = ax^{n+1}$

$\therefore x^{n+1} = \frac{b}{a}$ $\therefore x = \sqrt[n+1]{\frac{b}{a}}$

$\therefore$ Series $= a.$ $a\sqrt[n+1]{\frac{b}{a}}, a\sqrt[n+1]{\frac{b^2}{a^2}}, \ldots$ etc. ... b.

Part 2.

$\frac{ax^3 + bx^2 + cx + d}{ax^2 + c} = x + \frac{b}{a} + \frac{d - \frac{bc}{a}}{ax^2 + c}$ by division.

$\frac{b}{a}$ is integral; therefore it required

to show that $d - \frac{bc}{a} = 0$, if a, b, c, d are in G.P.

$\therefore$ a, b, c, d are in G.P.

$\therefore \frac{a}{b} = \frac{c}{d}$ $\therefore ad = bc$ $\therefore d = \frac{bc}{a}$

$\therefore d - \frac{bc}{a} = 0$ $\therefore$ Remainder vanishes.

Q. E. D.

Question 5.—If $a^x = b^y = c^z$, and x, y, z are in harmonical progression, then a, b, c are in geometrical progression.

$a^x = b^y = c^z$. x, y, z are in H.P. $\therefore y = \frac{2xz}{x+z}$

$\therefore b^{2y} = b^{\frac{4xz}{x+z}} = a^x c^z$. Now dividing each power by $\frac{xz}{x+z}$

$\therefore b^4 = a^{\frac{x+z}{z}} \times c^{\frac{x+z}{x}} = a^{\frac{x}{z}+1} \times c^{\frac{z}{x}+1}$

$= ac \times a^{\frac{x}{z}} \times c^{\frac{z}{x}}$ but $a^x = c^z$ $\therefore a^{\frac{x}{z}} = c$ and $c^{\frac{z}{x}} = a$

$\therefore b^4 = acac = a^2c^2$

$\therefore b^2 = ac$ $\therefore \frac{a}{b} = \frac{b}{c}$ $\therefore a, b$ and c are in G.P.

Q. E. D.

Question 6.—Two men, A and B, agree to perform equal pieces of work. A begins one piece, and B the other, and after working for p days they change pieces. A finishes B's piece in q days, and then returns and helps B, and after working together for r days they finish the piece. How long would each be in doing either piece?

Let x = days for A to do one piece. $\therefore$ A does $\frac{1}{x}$ of a piece in 1 day. It takes A and B $\frac{p+q+r}{2}$ days to do one piece. $\therefore$ A and B do $\frac{2}{p+q+r}$ of a piece in 1 day. $\therefore$ B does $\frac{2}{p+q+r} - \frac{1}{x}$ in one day.

To do first piece it takes A $(p+r)$ days, and B $(q+r)$ days.

To do second piece it takes A q days, and B p days,

$\therefore$ Fraction of first piece done by A $= \frac{p+r}{x}$

$\therefore$ " " " B $= (q+r)\left(\frac{2}{p+q+r} - \frac{1}{x}\right)$

$\therefore$ whole of first piece $= \frac{p+r}{x} + (q+r)\left(\frac{2}{p+q+r} - \frac{1}{x}\right)$

But Fraction of second piece done by A $= \frac{q}{x}$

" " " " B $= p\left(\frac{2}{p+q+r} - \frac{1}{x}\right)$

$\therefore$ whole of second piece $= \frac{q}{x} + p\left(\frac{2}{p+q+r} - \frac{1}{x}\right)$

And as whole of first piece = whole of second piece,

$$\therefore \frac{p+r}{x} + (q+r)\left\{\frac{2}{p+q+r} - \frac{1}{x}\right\} = \frac{q}{x} + p\left\{\frac{2}{p+q+r} - \frac{1}{x}\right\}$$

$$\therefore \text{transposing } \frac{p+r-q}{x} = \frac{(p-q-r)2}{(p+q+r)} - \frac{p-q-r}{x}$$

$$\therefore \frac{2(p-q)}{x} = \frac{2(p-q-r)}{(p+q+r)}$$

$$\therefore x = \frac{(p-q)(p+q+r)}{(p-q-r)} \text{ days.}$$

B does $\frac{2}{p+q+r} - \frac{p-q-r}{(p-q)(p+q+r)} = \frac{(p-q+r)}{(p+q+r)(p-q)}$ in 1 day.

$\therefore$ B takes $\frac{(p-q)(p+q+r)}{(p-q+r)}$ days.

And A takes $\frac{(p-q)(p+q+r)}{(p-q-r)}$ days.

Question 7.—Assuming the formula for the number of permutations of n things taken r together, find the number of combinations.

The number of combinations of n things, 5 together, is $10\frac{1}{2}$ times the number 3 together, find n.

(A) Let ${}^nC_r$ denote the required number of combinations. Then each of these combinations consists of a group of r dissimilar things which can be arranged among themselves in $\lfloor r$ ways.

$\therefore {}^nC_r \times \lfloor r =$ number of arrangements of n things taken r at a time, that is—

$${}^nC_r \times \lfloor r = {}^nP_r = n(n-1) \ldots (n-r+1)$$

$$\therefore {}^nC_r = \frac{n(n-1) \ldots (n-r+1)}{\lfloor r}$$

or, it may be written $\frac{\lfloor n}{\lfloor r \ \lfloor n-r}$ by multiplying numerator and denominator by $\lfloor n-r$.

(B) ${}^nC_5 = 10\frac{1}{2}\ {}^nC_3$; $\therefore \frac{\lfloor n}{\lfloor n-5 \ \lfloor 5} = \frac{21}{2} \times \frac{\lfloor n-3}{\lfloor n \ \lfloor 3}$

Multiplying each side by $\frac{\lfloor n-5}{\lfloor n}$ $\therefore \frac{1}{\lfloor 5} = \frac{21}{2} \times \frac{1}{(n-3)(n-4)\lfloor 3}$

$\therefore 2 \lfloor 3 (n-3)(n-4) = 21 \lfloor 5$; $\therefore (n-3)(n-4) = 210$ cancelling by $2 \lfloor 3$

$\therefore n^2 - 7n - 198 = 0$ $\therefore (n-18)(n+11) = 0$

$\therefore n = 18$ or -11.

The value -11 is meaningless $\therefore n = 18$. Ans.

(To be continued.)

NOTES AND NOTIONS.

BY J. H. YOXALL.

III.

THE wideawake teacher, apt to seize on every new chance in the development of his own resources and the resources of his profession, is just now keeping his north eye open, no doubt, upon the optical lantern as a teaching aid. In some few schools the lantern is already at work. Redeemed from its first uses, raised from the level of 'Chinese Fireworks, the 'Tale of a Tub,' and the 'Man Swallowing Rats,' etc., etc.—with which the name of magic-lantern has so long been associated—the 'optical lantern' is now dignified not merely in name but in vocation. In some few schools, I say, it is daily used to demonstrate the picturesque side of geography, or the diagrammatic side of elementary science. The windows of the class-room are darkened with closely-fitting black blinds, and the pictures are thrown on a glazed and light-hued expanse of wall. Speechless the youngsters sit, all eyes for the flitting pictures, all ears for the teacher's explanation of them; and, as one enthusiast said to me, 'More geography is taught permanently in one lesson than can be otherwise taught in ten lessons.' I quite believe it.

* * * * *

THE chief difficulty is not the management of the lantern nor the exclusion of daylight: the chief difficulty is the getting of suitable slides. The manufacturers and dealers in such things at present cater chiefly for the popular penny or threepenny lecture, and 'Silver Bells Across the Snow' or 'Buy your Own Cherries' is not the kind of thing the teacher wishes for school use. The number of 'lectures' and 'sets' is almost endless, but the most careful picking and choosing among them hardly results in a collection satisfactory from the *teacher's* point of view. The photographers scarcely seem as yet to proceed intelligently in this matter. They provide excellent 'views' of the Post Office at Montreal or Government House at Calcutta, but they never seem to have thought that sane persons would prefer 'slides' of a wigwam or a squad of Sikhs. They will show you pictures of Redskins, but Redskins 'got up' in their Sunday best, not 'as to the manner born'; and if they give you a glimpse of a French or German vineyard, it is the scanty foreground or half-hidden background to some building about which you do not care a rap, and which is by no means characteristic or illustrative from the geographical point of view. For a lesson on New Zealand the teacher wants 'slides' of Maories in their reservation and of the Kauri gum fishery, not a faithful representation of every brick in a street at Christchurch, or every wave in Auckland Harbour. The travelling photographer does not seem to dream in the least that bricks and waves are very much alike all the world over.

* * * * *

So at present the enthusiast with a lantern in school has mainly to make his own slides, a tedious and often unsatisfactory occupation. At present that is the only sure way to secure a collection that is really illustrative of what the teacher wishes to impart; but surely, after a while, when lanterns in school are as numerous as libraries, the manufacturers will discover the want and meet it.

* * * * *

BUT even now there is no need for the teacher who cannot own a lantern, or darken a room in daylight, to give up the idea entirely. Lanterns and slides may be cheaply hired, and the lads or lasses will willingly come back to school in the gloaming for a picture-lesson. For more than two years these evening lessons in geography have been given in the Sharrow Lane Board School, Sheffield, once a month or so on an average, and with excellent results. *That* is a species of overtime for which there is some excuse.

* * * * *

WRITING of geography-teaching reminds me that

it does not do for a public man, M.P. or Cabinet Minister, to be too geographically-wise. I have in mind just now two politicians, on different sides of the House, who have been laughed at rudely, though unjustly, for scraps of geographical wisdom which they have incorporated in speeches. One was ridiculed for speaking of a 'third hemisphere,' as though, geographically, there were not six at least. The other was ridiculed for mentioning 'the coasts of Poland,' as though the partition of the Empire of Casimir and Stanislas had moved it away from the Baltic. A little knowledge is a dangerous thing, we know on Pope's authority, if not from experience; but so also, sometimes, is too much.

* * * * *

THERE is no great danger of too much knowledge on the part of a considerable portion of the populace; the attendance at school is too irregular, and too many of those who do attend come with so much less than the normal capacity of brain. Well may the teacher seek out new and better modes of teaching; and well may he even then despair. Here are a few examples of 'cross questions and crooked answers' in school that have lately been divulged to the public:—

What is the feminine of 'hero'?

Shero!

If you want to lead me due north, which way would you go?

Upstairs!

George III. had a great dislike to being seen in public. What does that mean?

Didn't like to be seen in a public-house!

What is a blacksmith's shop?

Place where they make horses. I saw a man nailing on the last foot of one!

These are not remarkable, perhaps, when one considers the small amount of education which so many myriads of children have in their blood. One could not be hopeful of the offspring of the parents who wrote:—

'*Ples exkowl yon Boy for not ben at skowl on monday fry day. Briggs's.*'

'*Please ix squus my sun carnan i af to go to weark, mister finn.*'

The *Journal of Education* and the *Board Teacher* are responsible for these; but who is responsible for the state of things that produced them—the race, the State, or the teachers? Not the *teachers*, plainly, for although one may make bricks without straw, one cannot make bricks without clay.

* * * * *

The Hon. and Rev. E. Lyttleton, a headmaster who has to deal with boys who come to school furnished with a vocabulary learned in the nursery, and with the advantage given by descent from several generations of educated people, has been writing in a new review on the evergreen question of Greek in schools. And this is how he puts the question—

'Are we wise in doggedly continuing to give boys of average or inferior ability training in two languages, which they would get very nearly as well, or as some think, much better in one, *at the cost of starving them in history, geography, scripture, mathematics, English, and science?*'

* * * * *

Those italics are mine, and I use them the better to exhibit a question which one would think never need be put. Can anything be more absurd than to insist on Greek, or even on Latin, from schoolboys at such a cost! And yet the secondary schools, most of them, and certainly those of them which are by courtesy called 'the public schools,' doggedly continue, as Mr. Lyttleton says, in a course which makes the best of their pupils inferior in all-round equipment to a fairly able Seventh Standard boy from any public elementary school where Science in any form is taught. Surely, the boasted common sense of the English was never more at fault; and surely Parliament will before long insist on some modernising and systematising of secondary public schools.

* * * * *

Apparently imbued with a sense of superiority, the Association of Head Masters of Secondary Schools, and the Association of Principals of Private Schools, and the College of Preceptors decline to admit to the benefits of their projected Registration Bill the teacher in the Board Schools or the schools under voluntary control. One cannot but regret to see in this the old bad feeling of caste, the mischievous social barrier which has so long prevented the unification of the teacher, and the elevation of his profession to the status and privileges of the professions of medicine and law. Nobly is the Teachers' Guild working to break down this barrier; but we shall see again the indecent spectacle of two Registration Bills—one comprehensive, the other exclusive—giving reason for the M.P. to refuse consent to either, and affording occasion for the enemy to blaspheme. And yet the *Globe* has taken up its parable against what it calls 'the pirate schoolmaster'—(no, *pirate* is not a misprint for *private*, although in many cases it may mean the same thing).

* * * * *

THE pirate schoolmaster! 'He is,' says the *Globe*, 'in the typical case, intellectually the inferior of the humblest assistant in the public elementary school, a man who has never seen a university, and who decorates his name, as knavery or folly prevails in his nature, with a D.D. or M.A. of his own devising, or with the conspicuous A.S.S. of some bogus learned society to which he pays a guinea a year. He is always exuberant in his promises of sound religion, correct morals, and unlimited diet. Usually his establishment boasts resident foreign masters and a resident cow. He will undertake to board and lodge children, watch sedulously over their morals, and give them the best of instruction, for five pounds a quarter.'

* * * * *

I AM not sure that even *that* is the worst type of 'private' school.' What about the twopenny schools, held in living rooms, and managed by bankrupt laundresses and seamstresses with a weakness for gin. I have seen sixty children turn out of one room in a private house, and that room only twelve feet square and nine feet high! That is but a type of thousands of such dens of ignorance and disease, which local authorities still 'recognise,' and which the Department never stirs to exterminate. Truly, it cannot be said that England is in earnest about education, even yet.

* * * * *

THERE are no State pensions for teachers in America, and no system of superannuation has been established by law. In default of these, the teachers of many cities in the States have organised Annuity Aid Associations, a small payment to which entitles a member,

after thirty-five years of service, to a pension of about 60 per cent. of his salary at time of retirement. The funds are mainly raised by bazaars; the Philadelphia Association lately netted £12,000 in that way. Will it come to that in England, one wonders? The latest demand for superannuation by English teachers comes from the Association of Assistant Masters in Secondary Schools, a body with which every teacher in other schools should feel much sympathy.

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RECEIVED communications from 'H. I.' and 'Mixed Metaphor.'

—o—

LONDON MATRICULATION.

OUR PREPARATION CLASS FOR PRIVATE STUDENTS.

BY T. RUSSELL MALTBY, M.A.
Kingswood School, Bath.

JUNE, 1892.

(THIRD MONTH.)

I. LATIN.

Notes on February Work.

Allen's Grammar, Sects. 57-85.

(1) Deponent Verbs have *four* participles (*utens, usurus, usus, utendus*). Of these, *three* are active in meaning (*using, about to use, having used*), but the gerundive is *passive* in meaning (*to-be-used*). Hence the gerundive is only found in transitive verbs and intransitive verbs used impersonally.

(2) The perf. part. of verbs otherwise deponent often has a passive sense (*adeptus, gained,* or *having gained*).

(3) Note the fut. inf. of deponents (*usurus esse,* not *usum iri*).

(4) More than half of all the deponents are of the first conjugation.

(5) VOLO: Distinguish various forms of *vŏlo* and *vōlo*. *Sīs* may be (1) pres. subj. of *sum,* (2) = *si vis*. *Sultis* = *si vultis*.

(6) FERO: *Tuli* (= *tetuli*) comes from the root of *tollo; latum* is for *tlatum*.

(7) EO: Some compounds of *eo* being transitive are inflected in the passive, *e.g. adeo*:—

Ind. Pres. *ad-eor, -ĭris, -ĭtur, ĭmur, -ĭmini, -euntur.*
— Fut. *adibor,* etc.
— Perf. *aditus sum,* etc.
— Imperf. *adibar,* etc.
Subj. *adear, aditus sim, adirer,* etc.
Inf. *adiri, aditus esse.*
Part. *aditus, adeundus.*

(8) In the perfect tenses of *eo* the forms without *v* (*ii, ieram,* etc.) are more common.

(9) *Ambio* is inflected regularly, like *audio*. Note the componnd *prodeo,* and distinguish its parts from those of *prodo*.

(10) FIO: Most compounds of *facio* change *a* to *i*, and are inflected regularly (*conficio, conficior*); but some compounds retain the *a* and have *-fio* in the passive (*benefacio, benefio*).

(11) EDO: All forms of *sum* beginning with *es* may also be parsed as parts of *ĕdo,* a verb which should be written out in full. Distinguish *ĕdo* and *ēdo* throughout.

(12) QUEO and *nequeo* are rarely used except in the present.

Queo, quīs, quit, quīmus, quītis, queunt.
Nequeo, nonquīs, nequit, nequīmus, nequītis, nequeunt.
Quibo, quivi, quibam, etc.
Queam, quirem, etc.

Pres. Part. *quiens* (gen. *queuntis*).
Parse *quisse, quitur,* and, in three ways, *quis*.

(13) Learn the list of interrogative words at the end of Sect. 60. Remember that these are in themselves sufficient to make a sentence interrogative.

(14) AIO: Imperat. *ai,* pres. part. *aiens*.

(15) COEPI: The passive (*coeptus sum,* etc.) is used only with passive infinitives. *Osus* is active or passive in meaning.

(16) FARI: The pres. part. may be seen in *infans,* which is used as a noun (*child*). Compare the adjectives *infandus, nefandus*.

(17) QUAESO, *I ask* (old form of *quaero*):—*Quaeso, quaesumus, quaesĕre, quaesens*.

(18) Mark the quantities of *cĕdŏ, cĕdĭtĕ,* and compare with *cēdō*.

(19) As *semi-deponents* we sometimes find *iuro, swear, nubo, marry,* and *placeo, please*. Note the forms *ausim* (pres. subj.) and *sodes* (= *si audes*).

Allcroft and Haydon, Sects. 80-150. The important rule of Sect. 106 is given in rhymed form in Allen, Sect. 301. We append some notes on the construction of these common verbs.

(1) Verbs of ASKING: *posco, postulo, rogo,* etc., all take *ut* (or *ne*) with subj.

(2) WISHING: *cupio, opto, studeo, libet,* etc., take an infinitive more commonly than *ut* with subj. *Vŏlo* takes infin. (especially passive infin.), *ut* with subj., and subj. without *ut*.

(3) RESOLVING: *placet* takes *ut; consilium capere* and *inducere animum* take *ut,* or infin.; *statuo, constituo,* and the rest take infin.

(4) COMMANDING: *iubeo* takes infin.; *edico, impero, mando, praecipio,* etc., take *ut* with subj.

(5) CAUSING: *facio, efficio,* etc., take *ut*. *Curo* in this sense takes a gerundive in agreement with its object.

(6) TAKING CARE: *caveo, curo, video,* etc., all take *ut* or *ne*.

(7) GAINING: *consequor, impetro,* etc., take *ut*.

(8) PERSUADING: *adduco, induco, persuadeo,* etc., all take *ut*. When *persuade* means *convince* (not *induce*) the accusative with infinitive will be required.

(9) ALLOWING: *patior* and *sino* take infin.; *concedo, permitto,* and the rest take *ut*. *Licet* may take infin., *ut* with subj., or subj. without *ut*.

(10) FORBIDDING: *veto* takes infin.; *interdico, praedico,* and the rest take *ne* or *ut*. N.B.—After these verbs of forbidding 'to' must be translated by *ne,* 'not to' by *ut*.

(11) HINDERING and PREVENTING: *Impedio, obsto, prohibeo,* etc., take *ne, quin,* or *quominus; impedio* and *prohibeo* may also take infin. N.B.—If the verb of hindering is negatived in any way, *ne* is not admissible in the subordinate clause.

(12) ADVISING: *Hortor, moneo, suadeo,* etc., and their compounds all take *ut*.

(13) STRIVING: *Nitor* takes *ut; adorior* and *conor* take infin.; *tento* rarely governs a clause.

Latin Course for March.

1. *Allen's Grammar, Sects. 149-153.* (Principal Parts of Verbs.) Learn the meanings and the notes. Observe the quantities of the vowels.

2. *Allcroft and Haydon, Sects. 151-205.* Learn the examples.

3. *Allcroft and Haydon, Exercises VII., VIII., IX., X.* A's and B's only. Ninety sentences. Learn the vocabularies.

4. *Vergil, Aeneid VI., 628-901.* Write out a translation of your own.

To ensure a knowledge of the *contents* of the book write out an abstract. Prepare a similar 'argument' for Book VII.

5. *Translation at Sight. Hardy's Reader,* Nos. 45, 47, 48 50, 51, 57, 59, 62—about *two* extracts a week. See our notes for February.

II. GREEK.

Notes on February Work.

Abbott and Mansfield, Sects. 101-121.

(1) Sect. 114 (Perfect and Pluperfect Passive of consonant Verbs) contains some difficult work. The Rules for the Change of Consonants in Verbs (Sect. 113) explain most of the forms, but not all. Add this rule—*In passive and middle endings σ is dropped between two consonants.*

(2) Thus, in the formation of the perf. infin. πεπλέχ-θαι, two rules are illustrated. (*a*) The form πε-πλεκ-σθαι (cp. λε-λύσθαι) becomes πε-πλεκ-θαι, by omission of σ between two consonants. (*b*) πεπλεκ-θαι becomes πεπλέχθαι, by assimilation of a mute to an aspirate.

(3) Contracted Verbs: Learn the three sets of rules. If these are well known, and λύω is mastered, contracted verbs present little difficulty. The rules most commonly neglected are—(*a*) ο with *any* long vowel becomes ω, (*b*) ο with *any* combination of ι becomes οι; *e.g.*, pres. subj. act. δηλῶ, δηλοῖς, δηλοῖ, δηλῶτον, δηλῶτον, δηλῶμεν, δηλῶτε, δηλῶσι.

Greek Course for March.

1. *Abbott and Mansfield, Sects. 122-128, 147-162* (Augment Reduplication Verbs in -μι). The omitted sections, on the Formation of Tenses, should be thoroughly read by those who have time. Sects. 159-162 are of the first importance.

2. *Abbott and Mansfield, Syntax, Sects. 1-32.*

3. *Xenophon, Anabasis IV., III. 17 to IV. 20.*

4. *Translation at Sight. Initia Græca, Part II.* Mythology, Nos. VIII., X., XV., XVI., XIX. (Orpheus, Prometheus, The Sphinx, Helen, Theseus) and Grecian History, Nos. II. and III. (Marathon, Thermopylæ). About one page a week—*written* work.

FRENCH.

Notes on February Work.

Breymann, pp. 49-98. (Strong Verbs.)

(1) Questions: Give the third person singular of—

Simple and compound tenses of *ne pas bien se conduire, to misbehave* (affirmatively);

Compound tenses of *se faire mal au bras, to hurt one's arm* (negatively);

Simple tenses of *s'en abstenir, to abstain from it* (interrogatively);

Simple and compound tenses of *s'y faire, to grow accustomed to it* (interrogatively and negatively).

(2) *Craindre:* for practice, conjugate *ceindre* and *oindre.*

(3) *Ecrire:* so *inscrire, prescrire,* etc., and *décrire, récrire.*

(4) *Naitre:* verbs in *aître* and *oître* take a circumflex over *i* preceding *t.*

(5) *Prendre:* notice the meanings of the compounds *se méprendre* (*to make a mistake*), and *s'éprendre de* (*to take a fancy to*).

(6) *Rire:* so *sourire, to smile.* Look up *rire jaune.*

(7) *Faire:* note these compounds—*contrefaire, to mimic, défaire, to undo, se défaire, to get rid of, surfaire, to overcharge.* Study *faire* in a good dictionary: *qu'est que cela me fait? faire du cas de quelque chose, il fait froid, chaud,* etc., *il fait du vent, du brouillard, de la pluie,* etc., *il fait grand vent, il fait clair de lune.*

(8) *Voir: entrevoir, to catch a glimpse of.*

(9) *Connaitre: méconnaitre, to disregard.*

(10) *Croire* and *croître:* where these two are otherwise alike, *croître* is distinguished by a circumflex.

(11) *Moudre: émoudre, to sharpen.*

(12) *Plaire: complaire, to humour, se plaire à, to delight in. Plaire, complaire,* and *déplaire* are followed by *à.*

(13) *Résoudre à, to persuade; se résoudre de, to make up one's mind.*

(14) *Vivre: survivre à, to survive.*

(15) *Pouvoir:* in the interrogative form use *puis;* in the negative form, if *puis* is used, omit *pas.*

(16) *Savoir:* in the negative form omit *pas.*

(17) *Valoir: équivaloir, to be equivalent; revaloir, to make return* (see dictionary); *prévaloir, to prevail; se prévaloir, to avail oneself.* Observe the note (p. 93), subj. pres. *que je prévale.*

French Course for March.

1. *Breymann, Chapters II. and III.* (Articles and Nouns.)

2. *Fasnacht, Extracts 1, 4, 12, 13, 14, 28, 29.* Use the imitative exercises.

3. Of the above extracts, make *written translations* of Nos. 4 (Un Nez Gelé), 13 (Education d'un jeune Chevalier), 28 (Surprise dans les Forêts). Continue *La Jeune Sibérienne* in PRACTICAL TEACHER.

4. *Word-lists* and *Phrase-lists* as before.

III. ENGLISH.

1. *Mason, pp. 17-62* (Nouns, Adjectives, Pronouns). Learn all definitions, *e.g.*, *Inflexion, Case,* and mark them for final revision. Give attention to all etymological work, *e.g.*, the notes under Gender (Sect. 44), and Comparison (Sect. 115), and the history of all pronominal forms. Except under pronouns, the Anglo-Saxon sections are not absolutely necessary. Other parts of special importance are Sects. 57-62 (Plurals), 92-96 (Notes on Adjectives of Quantity), 123-125 (uses of the Articles). The Pronoun (127-179) should be mastered completely from beginning to end. The following points are difficult:—different origin of the forms *he, she, they,* etc., history of *these* and *those,* history of the relative *that,* uses of *one* and *either,* history of *self.* Why are *myself, thyself,* etc., classed with the Substantives, *himself,* etc., with the Adjectives?

2. *Hewitt and Beach, pp. 11-110* (Nouns, Pronouns, Adjectives). The lists of questions on pp. 11, 79, 50 will serve to test your work as above. Then supplement *Mason* by careful study of these exhaustive chapters.

3. *Ransome's History, 1399 to 1603, with the Geography relating thereto.*

IV. MATHEMATICS.

1. *Arithmetic, Part V.* Ratio, Proportion, Unitary Method, Interest, Discount, Stocks and Shares, etc. Cultivate a good style; work out some London questions.

2. *Algebra, Chapters XXIV. to XXVIII.* (L.C.M. and Fractions). Do not neglect the book-work. Observe the examples worked out. Employ the method of *factorising* constantly. Candidates should be able readily to resolve all expressions of the following general types:—

(*a*) $X^2 - Y^2$.
(*b*) $X^2 \pm (A + B)\,X + AB$.
(*c*) $X^2 + (A \sim B)\,X - AB$.
(*d*) $X^3 \pm Y^3$.

For instance—

(*a*) $(a^2 + b^2 + c^2 + ab + bc + ca)^2 - (ab + bc + ca)^2$.
$= (a + b + c)^2\,(a^2 + b^2 + c^2)$.

(*b*) $(a + b + c)^2 - 2\,(a + b + c)\,c + c^2$
$= [(a + b + c) - c]^2 = (a + b)^2$.

(*c*) $(a + b)^2 - 2\,(a + b)\,(c + d) - 24\,(c + d)^2$
$= [a + b + 4\,(c + d)]\,[a + b - 6\,(c + d)]$.

(*d*) $(8\,a^3 + (b - c)^3 = (2\,a + b - c)\,(4\,a^2 - 2\,ab + 2\,ac + b^2 - 2\,bc + c^2)$.

3. *Hall and Stevens's Euclid, pp. 120-143 (Book II.), and pp. 149-182 (Book III., 1 to 19).*

V. MECHANICS.

Course for March.

Magnus, Chapter VI. (Machines) *and revision of Chapters I. to VI.* (Kinematics and Dynamics). Many of our readers will be glad to hear that Messrs. Clive and Co. publish a book of 'Worked Examples in Mechanics' (by J. H

Dibb, B.Sc.). We recommend those who have marked a number of Magnus's Questions as 'unsolved' to get this book at once. (Price 1s. 6d.)

VI. CHEMISTRY.

Course for March.

Kemshead, Chapters III., IV. (if necessary), *VIII., IX.* (Laws of Combination, Weights and Measures, Chlorine, Hydrochloric Acid). Clive and Co. publish a very useful 'Synopsis of Non-Metallic Chemistry.' The book is meant to be used with a text-book, and is interleaved for note-making.

HEAT AND LIGHT.

Course for March.

Stewart, Chapters VIII. to X. (Vaporisation and Condensation, Hygrometry, Transmission of Heat). Learn the definitions, and mark them for revision. Practise making rapid sketches of apparatus and experiments.

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THE 1892 CERTIFICATE EXAMINATION.

BY DR. GEORGE BEACH, M.A.

Co-Author of 'Our Mother Tongue,' 'Arithmetic or Girls,' Author of 'Elements of English,' 'Entertaining Readers,' etc.

1. REMARKS ON THE ROUTINES.

(*a*) As only a Lunar Month is occupied by the Routines, two or three days in every Calendar month are thus reserved for overtaking of arrears, revision or recreation.

(*b*) As far as possible the same work is set both for Women and Men, and for First and Second Years.

(*c*) When the rectangle representing an hour's work is divided into two parts, the upper portion is devoted to the Men, the Staff Notation, or Spencer, whilst the lower part is arranged for Women, Tonic Sol-fa or Locke.

(*d*) We will guarantee that every part of the syllabus shall be gone over several times, and the more difficult portions or favourite areas *many* times.

(*e*) The difficult words to be parsed, etc., are as follows :—

FIRST YEAR.

(1) *All, hair, hung, slaughtered, grief, supplied, for, their, nor, to look, had stood, when, purple,* OR, *There, roaring, night, heavily, but, is rising, bright, his, own, as, that, out, she, that, glittering, way, wherever, doth.*

(2) *Moment, steed, loosened, where, who, mid, whence, league, spy, cliffs, doubling, borne, which, later, when, shall teach,* OR, *Daughter, O, if, name, light, to guide, thou, when, there, are, not, be, where, no, rely, hearts, thy, Oh, misplaced, arms.*

(3) Analyse Bacon's Essay IX., from, '*Persons of noble blood*' . . . to '*per saltum.*' *Rising, for, but, done, besides, there, much, added, as, sunbeams, hotter, than, those,* OR, *When, owes, is, therefore, sovereign, perhaps, tell, us, no, than, some, king's, have been called, some, his.*

(4) PARAPHRASE Bacon's Essay II., from '*And by him that spake only as a Philosopher*' to '*Fear occupateth it,*' OR, first fourteen lines of '*Tintern Abbey.*'

SECOND YEAR.

(1) *Fairest, that, being, forsaken, virtues, he, cast, that, kindle, king, thrown, ours, waterish, can, where.*

(2) *Persuade, that, bend, spoke, was bound, sir, fine, seeing, opposite, lanced, mine, when, roused, whether, gasted, full.*

(*f*) The following extracts are recommended for repetition :—

FIRST YEAR.

'*Tintern Abbey*' and '*Resolution and Independence.*'

SECOND YEAR.

	Act.	Scene.	Lines.	No. of Lines.
'King Lear'	I.	I.	28 to 259	232
" "	IV.	VI.	1 to 80	80
				Total 312

2. POPULATION OF INDIA.—(*Men Candidates.*)

The Indian Census Returns, which have just been completed, show that almost one in every five human beings inhabits 'our great Eastern Dependency.' In 1890 careful estimates assumed that 1,467,600,000 people were in existence ; and at the same period, as we now learn, in India alone 288,159,672 of these were directly or indirectly under British influence.

The Census was taken in India both in the regular way and also by tribal registration. The former returns are deemed absolutely trustworthy, but the latter are more or less defective. This is, however, of little consequence, as they form only about one-third per cent. of the whole.

By the regular census the number ascertained was 287,207,046, and from the tribes was reported 952,626.

It is scarcely possible for us to realise what these figures mean—what the significance is of nearly three hundred million people living in one country under our sway.

All Europe has only a population of about 400,000,000, and England, France, Germany, and Italy combined contain only half as many people as Hindostan.

In British India there are 221,356,187 inhabitants, and in the native states 66,803,485, a greater number than is commonly supposed.

Since 1880 there has been a net increase of 28,000,000.

In many districts the overcrowding is terrible, and the struggle for existence of millions of natives on small and comparatively unproductive land is frightful. India is not a rich, but a very poor country, and what wealth there is, is most unevenly distributed, the masses, even in the best times of trade and agriculture, being on the very margin of subsistence.

What, then, must be their condition when trade is slack and rain fails? Even now, upon the next monsoon depends the lives of thousands.

Great attention should be paid to the Geography of Hindostan, as taking the average of the last ten years, twenty-five per cent. of the Geography marks can be thus obtained.

3. First Year women students should procure Keith Johnston's smaller 'Geography of Africa,' price one shilling, and 'Stanley in Africa,' by Walter Scott. In addition, if Keith Johnston's larger work on Africa be occasionally consulted at a reference library, and Brook's Geography and Gregory's Physical Geography be used constantly, they will be well equipped.

4. HISTORY may be well studied as follows :—(*a*) Acquire a thorough knowledge of the general outline, with a due regard to the sequence of events. (*b*) Fix these more particularly in their exact places by learning the principal dates. (*c*) Go through the whole period separately as regards Literature, Constitutional Progress, Development of the Empire, Social Progress, Naval and Military matters. The various wars, treaties, etc., should also be assorted, so that a student may be able to write out all the wars, treaties, etc., with Spain, France, etc. (*d*) Be familiar with the lives of the great men who directed the national career and advancement, whether they be politicians, philosophers, writers, or generals. Biographies are easily remembered.

It is profitable to note that the History for Men Candidates is the same as was set in 1873, 1874, 1886, and 1889 ; and that portion for Women coincides more or less exactly with the work provided for the eighteen years, 1871-1888 inclusive.

5 PENMANSHIP.—The general character of the writing in the Examination Papers will have much to do in deciding the proficiency of Candidates. The four chief qualities are Legibility, Regularity of outline, Observance of the standard proportions, and Facility of execution.

Small hand as taught in schools is apt to be too small and indistinct. It should be firm, round and legible. The Greek *e*, the straggling *k*, the looped *p*, the uncrossed *t* must not be used.

Large hand should be from three-eighths to half an inch high ; but providing it be bold and legible, and the standard forms and proportions of the letters be observed, 'My Lords' do not desire to prescribe a uniform rule, either as to exact style or size. There should be no long looped-strokes above the line, and where there are two forms of Capitals, such as for letters *a, c, m, n, s, v, w,* one of which is merely an enlarged form of the small letters, and the other a distinctly different character, the latter should be used.

ALGEBRA.—There is no set of questions propounded where factorising is not needed. In many cases where it is not absolutely necessary, it affords most pleasing and elegant solutions. In equations, measures and multiples, fractions, involution and evolution, and in the permutations and combinations, a through knowledge of factors is indispensable. It is a subject not to be neglected by the most skilled, for somethimg new can always be learnt.

CERTIFICATE ROUTINE FOR MARCH, 1892 (MEN AND WOMEN, FIRST YEAR).

DAYS	FIRST WEEK.			SECOND WEEK.			THIRD WEEK.			FOURTH WEEK.		
	I.	II.	III.	I.	II.	III.	I.	II.	III.	I.	II.	III.
MONDAY	General Principles of Teaching	Read 'Lay of Last Minstrel,' Canto I. *or* 'Tintern Abbey'	Euclid, Book III., Props. 1 to 7, *or* Repairing Underclothing	Training of the Eyes	Language of Wordsworth *or* Scott	Euclid, Book III., Props. 8 to 15, *or* Diagram of a Woman's Chemise	General Principles of Teaching	Analyse Lines 283-208 of 'Lay of Last Minstrel,' Canto I. *or* Lines 1 to 16 of 'Ode to Duty.' Parse difficult words	Euclid, Book III., Props. 16 to 23, *or* Repairing of Underclothing	How to Teach Writing	Analyse and Parse from Essay IX., *or* Lines 27 to 33 of p. 15 of 'Burke's Reflections'	Euclid, Book I., *or* Questions on Needlework
TUESDAY	Chief Dates from 1066 to 1215	Involution of Algebra *or* Composition of Food	List of the British Colonies *or* Physical Features of Africa	Chief Dates from 1215 to 1376	Sequence of Intellectual Development	Shape, Size, and Motions of the Earth	Tables of the Norman and Angevin Dynasties	Ratio, Proportion, and Variation of Algebra, *or* Organs of Digestion	British Possessions in Europe, *or* Physical Features of Africa	Chief Dates from 1376 to 1461	Geometrical Progression, *or* Cost of Clothing	The Atmosphere, Rain, Clouds, and Vapour
WEDNESDAY	The Cultivation of Intelligence	History from 1066 to 1215	How to Teach Reading	Discount, *or* Theory of Practice	Clock Problems, *or* Bills of Parcels	Measures and Multiples of Algebra, *or* Functions of Food	Notes of a Reading Lesson to Standard VII.	Problems of Motion *or* Theory of Vulgar Fractions	Euclid, Book I., Props. 1 to 26, *or* Cutting-out of a Woman's Chemise	Mensuration of Parallelograms, *or* Decimal Fractions	Problems on A, B, and C., etc., *or* Theory of Decimals	Physical Features of Hindostan *or* Africa
THURSDAY	History from 1603 to 1624, *or* Revision	Evolution of Algebra *or* Nutritive Value of Food	Map of Physical Features of England, *or* Africa	History from 1215 to 1376	Algebraic Fractions and Surds, *or* Organs of Mastication	Winds, Currents, and Tides	Tables of the Yorkist, Lancastrian and Tudor Dynasties	Arithmetical Progression *or* Materials of Clothing	Map of Hindostan *or* Political Africa	History from 1376 to 1461	Harmonical Progression, *or* Cleansing of Clothing	General Geography of Cape Colony
FRIDAY	Cube Root *or* Practice	Deductions on Book I., *or* Diagram of a Woman's Chemise	Analyse lines 94 to 107 of 'Lay of Last Minstrel,' Canto I., *or* Lines 1 to 14 of 'Resolution and Independence.' Parse difficult words	Constitutional Changes and Literature of the Period, *or* Revision	Deductions on Euclid, Book II., *or* Cutting-out of a Woman's Chemise	Style of Bacon *or* Burke	Mensuration of Triangles *or* Vulgar Fractions	Deductions on Euclid, Book III., Props. 1 to 15, *or* Any Needlework	Read Bacon's Essays 1, 2, 4, 5, *or* pp. 1 to 30 of 'Burke's Reflections'	Problems on the Work of Mixed Agents, *or* Simple Interest	Cultivation of the Intelligence	Read 'Lay of Last Minstrel,' Canto II., *or* pp. 30 to 60 of 'Burke's Reflections'
SATURDAY	Music, the Major Scale and its Structure	Science	Drawing	English Composition, 'The Life of Scott or Burke'	Music, Value of Notes and Rests	Science	Drawing	Repetition, Literature, and Penmanship	Music, Diatonic Intervals	Science	Drawing	Paraphrasing (see Article)	Musical Terms in Common Use	Science	Drawing	Repetition, Literature, and Penmanship

CERTIFICATE ROUTINE FOR **MARCH, 1892** (MEN AND WOMEN, SECOND YEAR).

DAYS	FIRST WEEK.			SECOND WEEK.			THIRD WEEK.			FOURTH WEEK.		
	I.	II.	III.	I.	II.	III.	I.	II.	III.	I.	II.	III.
MONDAY	School Organisation	Read 'King Lear,' Scenes 1 to 3 of Act I.	Revise Euclid, Book I. — Practise Tucking, and Marking in Cross-stitch	Formation of Habits and Character	Read Cantos I. and II. of 'Last Minstrel,' *or* Lecture IV. of Trench's 'Study of Words.'	Revise Euclid, Book II. — Diagram of a Woman's Nightdress	The Health of Scholars and Teachers	Paraphrase Lines 100 to 212 of 'King Lear' Act I., Scene 4	Revise first 20 Props. of Euclid, Book III. — Practise Whipping and Feather Stitch	Pp. 1-22 of Spencer, *or* Sections 140 to 157 of Locke	Analyse lines 44 to 57 of 'King Lear,' Act II., Scene 1. Parse difficult words	Euclid, Book III., Props. 21 to 37 — Cutting-out Boy's Shirt
TUESDAY	Chief Dates from 1066 to 1270 — History from 1789 to 1802	Cube Root — Discount	As in First Year — General Physical Geography of Canada	Read 'Bacon's Essays,' 1, 2, 4, *or* Grammar from Text-Book	History from 1603 to 1642 — From 1808 to 1815	As in First Year — General Physical Geography of Canada	Chief Dates from 1270 to 1399 — Constitutional Changes from 1789 to 1820	Stocks	As in First Year — General Political Geography of Canada	History from 1642 to 1660 — Military Operations from 1789 to 1820	Clock Sums	As in First Year — Climate, Productions, and Commerce of Canada
WEDNESDAY	Analyse Lines 243-260 of 'King Lear,' Act I., Scene 1, and Parse difficult words	Problems leading to Quadratic Equations — Choice of Food	The Attendance Register, and How to keep it	Stocks	Soil, Aspect and Drainage of School Premises	Any Revision	Notes of a Reading Lesson to Standard VII.	Combinations — Preparation of Food	Any Revision	The Principles of School Routine Making	Permutations and Combinations — Food for the Sick	Any Revision
THURSDAY	History from 1066 to 1215 — From 1802 to 1808	Problems involving Square Root — Discount	As in First Year — Physical Map of British North America	Permutations — Food for the Sick	History from 1215 to 1377 — From 1815 to 1820	As in First Year — General Political Geography of Canada	History from 1377 to 1455 — Most important Treaties from 1789 to 1820.	Compound Interest	As in First Year — Political Map of British North America	History from 1455 to 1509 — Naval Operations from 1789 to 1820	Sums like Equations — Square Root	As in First Year — General Physical Geography of United States
FRIDAY	Problems in Simultaneous Quadratics — Duties of a Sick-Nurse	Deductions on Euclid, Book II. — Diagram of a Woman's Nightdress	The Processes of Reasoning	Permutations — Sources and prevention of waste in a household	Deductions on Euclid, Book I. — Write down directions for making a Boy's Shirt	Any Revision	Permutations and Combinations — Household Expenses	Deductions on Euclid, Book III. — Darning in Stocking-web Stitch	Read 'Bacon's Essays' 5, 9, 11, *or* Lecture V. of Trench's 'Study of Words'	Arithmetical Progression — Investment of Money	First 5 Props. of Euclid, Book IV. — Making of a Boy's Shirt	Paraphrase Lines 70 to 82 of 'King Lear,' Act II., Scene 2
SATURDAY	Music as in First Year / Science / Drawing / English Composition upon the character of 'King Lear'			Music as in First Year / Science / Drawing / Repetition Literature and Penmanship			Music as in First Year / Science / Drawing / English Composition upon the character of 'Cordelia'			Music as in First Year / Science / Drawing / Repetition Literature and Penmanship		

ARITHMETIC (*Men*).—Students and Acting Teachers who have not passed with credit in Arithmetic in the First Year papers of 1890 or 1891 must answer the questions in Arithmetic, instead of the Mensuration ones.

The problems set are not of an unusually difficult character, but they are generally framed in order to discover whether the Candidate has any manipulative skill, and they often involve algebraical principles. We shall give numerous specimens before December next.

(*Women, Second Year.*)—From these the explanation of Mental Arithmetic processes, the proofs of common operations, and the theory of the ordinary rules is expected.

Of frequent occurrence are questions upon Ratios, Proportionate Shares, Partnerships, Clock sums, Race sums, 'Tap' sums, Averages, Mixtures, and peculiarities of our Calendar.

Every year recently one question at least relates to Measures and Multiples, Percentages, Insurances, Square Root, Compound Interest, Stocks and Discount.

FIRST YEAR.

The favourite topics are Proofs of Rules, Definitions of Terms, Involved Reduction and Practice, Compound Proportion, Complex Fractions, both Vulgar and Decimals, and Percentages, and Chain Rule.

By both sexes and years the theory and properties of recurring decimals must be carefully and minutely understood. As an instance of the methods whereby method and perspicacity is tested, the following sum is worthy of note :—

Simplify— $\frac{\cdot 196\dot{3} \times 4{\cdot}58\dot{1}}{\cdot 458\dot{1} \times 19{\cdot}6\dot{3}}$.

If this were operated upon in the usual way the process would be a long one, but when it is seen that $\cdot 65\dot{4}$ is a measure of the first Vulgar Fraction, and that $6{\cdot}5\dot{4}$ is a measure of the second Vulgar Fraction, all obstacles vanish, thus :—

$$\frac{\cdot 196\dot{3}}{\cdot 458\dot{1}} \times \frac{4{\cdot}58\dot{1}}{19{\cdot}6\dot{3}} = \frac{\cdot 196\dot{3} \div \cdot 65\dot{4}}{\cdot 458\dot{1} \div \cdot 65\dot{4}} \times \frac{4{\cdot}58\dot{1} \div 6{\cdot}5\dot{4}}{19{\cdot}6\dot{3} \div 6{\cdot}5\dot{4}} = \frac{3}{7} \times \frac{7}{30} = \frac{1}{10}.$$

SELECTED GOVERNMENT QUESTIONS.

FIRST YEAR.

SECOND WEEK.

1. Write a Large hand copy of '*Mental Paralysis.*'

Write a Small hand copy of '*How do thy tuneful echoes anguish!*'

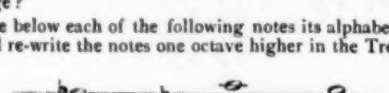
2. Write from Dictation :—

'How came the Assembly by their present power over the Army? Chiefly, to be sure, by debauching the soldiers from their officers. They have begun a most terrible operation. They have touched the central point about which the particles that compose armies are at repose. They have destroyed the principle of obedience in the great essential critical link between the officer and the soldier, just where the chain of military subordination commences, and on which the whole of that system depends. The soldier is told that he is a citizen, and has the rights of man and citizen. The right of a man is to be his own governor, and to be ruled only by those to whom he delegates that self-government.'

3. What is meant by the 'Association of ideas?' Give examples of different kinds of mental association, and show what practical bearing this question has on a teacher's work.

4. In the Class Registers, how will you ensure the correctness of (1) The number entered at every meeting at the foot of the attendance column (2) Of the total attendances of the week and of the quarter? (3) How would you deal with the registration of scholars who came too late to be marked on the registers? (4) How would you mark holidays and days devoted to examinations in Religious Knowledge?

5. Write below each of the following notes its alphabetical pitch name, and re-write the notes one octave higher in the Treble Clef.



OR,

What other four contiguous tones of the scale are separated by the same stops or intervals as (1) *me, fah, soh, lah*, and (2) *ray, me, fah, soh?*

(1) Semitone — Tone — Tone
me *fah* *soh* *lah.*

(2) Tone — Semitone — Tone
ray *me* *fah* *soh.*

6. Write the signatures of the following major keys A, D♭, B in Treble clef, and E, A♭ in Bass clef,

OR,

Which are the leaning or expectant tones of the scale, and which are the strong tones or tones of repose?

7. Write an essay upon (*a*) The days of Chivalry, or (*b*) The French Revolution.

8. See 3rd Hour of Friday in First Week of Routine.

9. Enumerate the principal motions of the Earth, and describe the resulting phenomena.

10. Draw up a list of the chief islands belonging to England, giving their size, productions, and situation; OR,

Describe the races and religions of Africa.

11. Mention the most famous Archbishops of Canterbury since the Conquest, and give a short account of any two of them.

12. (*Men only.*) Trace the descent of the Stuart Kings from Edward III.

(*Women only.*) Give short biographies of *any two* of the following persons :—Roger Bacon, Simon de Montfort, the Black Prince, Caxton, Sir Thomas More, Sir Francis Drake.

13. (*Men only.*) At a concert £60 was received for reserved seats, and the same sum for unreserved seats. A reserved seat cost three shillings more than an unreserved seat, but 360 more tickets for unreserved than for reserved seats were sold. How many tickets were sold altogether? Ans. 840 tickets.

(*Women only.*) Draw a diagram on sectional paper of a woman's chemise.

14. (*Men only.*) The difference of the cubes of two consecutive numbers is 919. Find the numbers. Ans. 17 and 18.

(*Women only.*) Cut out in paper the left half of an infant's shirt.

15. (*Men only.*) The adjacent sides of a parallelogram are 8 feet and 16 feet, and its area is half that of a square having the same perimeter. Find the perpendicular distance between each pair of opposite sides. Ans. 9ft. and 4½ ft.

(*Women only.*) How many oranges at £·084375 per dozen ought to be given in exchange for 378 eggs at ·0625s. each?

Ans. 168.

16. (*Men only.*) What is the value of $\frac{2\sqrt{18} + \sqrt{32}}{\sqrt{56} + 3\sqrt{14}}$ to three places of decimals. Ans. ·755.

(*Women only.*) A clerk copied 62·5 instead of ·625 of £100. What was the amount of his error?

Ans. £6,187 10s. too much.

17. (*Men only.*) Define *plane superficies, plane angle, semicircle, gnomen, angle of a segment, sector of a circle.* If a triangle PQR be turned about its side PQ, show by Prop. 4, Book I., that the line joining the two positions of R is perpendicular to PQ.

(*Women only.*) State the arguments for and against a purely vegetable diet.

18. (*Men only.*) To draw a straight line perpendicular to a given straight line of an unlimited length from a given point without it.

From a given point draw a straight line making equal angles with two given straight lines (I. 26 may be employed).

(*Women only.*) What kinds of food are best adapted to (1) hot, (2) cold, and (3) temperate climates?

FOURTH WEEK.

1. Write a Large hand copy of '*Volcanically Extinct.*'

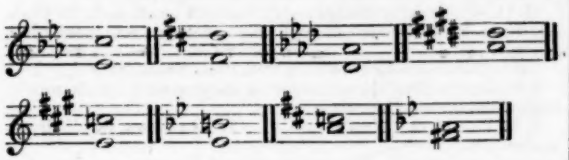
Write a Small hand copy of '*Low grumbling out loquacious croaks.*'

2. Write from Dictation 'Social life alters the nature of man, and consequently his aims and position, by the new passions which it creates. Above all it destroys that indifference to everything but his own freedom, which is the characteristic of natural man. Man in society is marked by deceit and levity in his conduct and demeanour; he is clever without wisdom; honour takes the place of virtue; amid all his pleasures he finds no happiness. Inequality, which in a state of nature hardly exists, acquires its force and development from our capabilities.'

3. Describe the cause and the cure of the habit of vague and inaccurate observation.

4. What is the exact meaning of each of these words :—*Reminiscence, Recollection, Memory?* Give some simple practical rules with reference to the character and right use of memory exercises in schools.

5. Write down under each of the following intervals its name :—



OR,

What circumstances tend to modify the mental effects of scale notes.

6. Write down the *air* of 'GOD SAVE THE QUEEN' correctly in either notation.

7. Write out a summary of Bacon's *Fourth Essay* OR '*Tintern Abbey.*'

8. Prepare the outline of a *first* lesson on the Preposition.

9. Explain the phenomenon of Rain, and give instances of rainless regions and regions of excessive downpour. How is the rainfall measured?

10. Draw a map of New Zealand OR, Egypt.

11. Explain shortly the circumstances which led to the formation of the Quadruple Alliance against Louis XIV. at the close of William III.'s reign. Why is Blenheim regarded as one of the decisive battles of the world? State the principal conditions of the Peace of Utrecht.

12. (*Men only.*) Name six authors (with their principal works) who were living between 1603 and 1620.

(*Women only.*) What is meant by '*Imperial Federation*'? What advantages or disadvantages do you see in Australia or Canada becoming independent of the Mother Country?

13. (*Men only.*) $x^2 + 2ax = b^2 + 2ab$. Ans. $b, -(2a + b)$.

(*Women only.*) Describe the various kinds of darns and their use as to a Pupil Teacher.

14. (*Men only.*) Show that if any integer be put for x in the expression $x^6 - 4x^5 + 14x^4 - 32x^3 + 49x^2 - 60x + 36$, the result will be a square number.

(*Women only.*) Give directions for the cutting out of an infant's shirt, observing the due proportions and economising the material.

15. If the ratio of threepenny to fourpenny pieces in a given sum which consisted only of these coins was altered from 3 : 7 to 7 : 3, the sum would be diminished by £20. Find the sum.

Ans. £185.

16. (*Men only.*) A person selling apples at three for a penny gains 5 per cent. Find the gain or loss per cent. when 25 are sold for sixpence. Ans. $24\frac{3}{4}$ loss.

(*Women only.*) Goods are bought for £250, and one quarter of them is sold at a profit of 15 per cent. At what profit per cent. must the remainder be sold to obtain a profit of 20 per cent. on the whole? Ans. $21\frac{1}{3}$.

17. (*Men only.*) All the exterior angles of any rectilineal figure, made by producing the sides successively in the same direction, are together equal to four right angles.

(*Women only.*) Explain the process of mastication, and describe the common causes of indigestion.

18. (*Men only.*) PQR is an equilateral triangle; H, K are points in QR, PR, such that QH = RK. Also QK, PH intersect at S. Show that the angle PSQ is 120°.

(*Women only.*) What evils result from an excessive use of tea and coffee?

SECOND YEAR.

SECOND WEEK.

1. As in First Year.

2. As in First Year.

3. What is understood by a Proposition, a Premiss, a Conclusion, and a Syllogism? Give an example of each.

4. As in First Year.

5. As in First Year.

6. As in First Year.

7. Quote from 'King Lear' any striking examples of the use of figurative language under the heads of (*a*) Simile, (*b*) Metaphor, (*c*) Personification.

8. See Routine, First Week, Wednesday, First Hour.

9. (*Men only.*) As in First Year.

(*Women only.*) Outline the History of Canada, and describe the present system of Government.

10. (*Men only.*) As in First Year.

(*Women only.*) Where and what are 'The White House,' 'The Bayous,' 'The Cañons,' 'The Rockies,' 'The Esquimaux,' and 'The Hudson'?

11. As in First Year.

12. (*Men only.*) As in First Year.

(*Women only.*) Enumerate the causes and describe the excesses of the French Revolution.

13. (*Men only.*) Prove that the sum of the squares of any number of unequal quantities, is less than the square of their sum.

(*Women only.*) Draw a diagram on sectional paper of a woman's nightdress.

14. (*Men only.*) In an examination it was found that the aggregate marks of each candidate came to the same amount. The examiner then assigned to each the square of the marks gained by him for each subject. Prove that if one candidate, and one only, was totally ignorant of every subject but one, he would come out head of the list.

(*Women only.*) Cut out in paper the left half of a boy's shirt.

15. (*Men only.*) Find the radius of a cylinder whose volume 10,000 c. inches, and height 50 inches. Ans. 7·979 ins.

(*Women only.*) As in First Year.

16. (*Men only.*) Find how long it will take to fill a hemispherical tank of 10 feet diameter, from a cistern which supplies by a pipe ·1 gallon per second. Ans. 4 hrs. 32 mins.

(*Women only.*) As in First Year.

17. (*Men only.*) Construct a triangle whose sides are equal to three given straight lines, any two of which are together greater than the third.

Show by diagrams what would happen if you attempt to construct triangles whose sides contain units in the following relations :—(*a*) 2, 3, 4 ; (*b*) 2, 3, 5 ; (*c*) 2, 3, 6.

(*Women only.*) Compare the value of beef, mutton, veal, poultry, and fish under the heads of nutrition and economy.

18. (*Men only.*) If a straight line falling on two other straight lines make the alternate angles equal to one another, or make the interior angles on one side together equal to two right angles, these two sides shall be parallel.

Show that a four-sided figure, which has all its sides equal and *one* angle a right angle, is a square.

(*Women only.*) Explain the terms :—*incisors, trachea, insalivation, asphyxia, capillaries, automatic.*

FOURTH WEEK.

1. As in First Year.

2. As in First Year.

3. (*a*) If the school attendance be irregular, describe in what form you could, from the registers, draw up a statement to put this irregularity in a striking light? (*b*) How do you find the average number of times attended per week by each child present at all? (*c*) How would you record punctual attendance? (*d*) Why would you write up the daily attendance in view of the school?

4. Assuming the truth of the statement that '*If A is B, C is D,*' say what inference (if any) can be drawn from each of the following statements :—

(*a*) *But A is B*
(*b*) *But A is not B*
(*c*) *But C is D*
(*d*) *But C is not D*

5. As in First Year.

6. As in First Year.

7. (*Men only.*) As in First Year.

(*Women only.*) What does Trench say about 'Consanguinity of Languages' and 'History in Language'?

8. See Routine, Fourth Week, Monday, Second Hour.

9. (*Men only.*) As in First Year.

(*Women only.*) Draw maps of the two great Canadian systems of Lakes.

10. (*Men only.*) As in First Year.

(*Women only.*) What are the occupations of people in Newfoundland, Kentucky, California, British Columbia, Texas, Lower Canada and Pennsylvania?

11. As in First Year.

12. (*Men only.*) Give dates of 'The Main Plot,' 'Colonisation of Ulster,' Execution of Raleigh,' 'Petition of Right,' Pacification of Berwick,' and 'The Battle of Newbury.'

(*Women only.*) Give dates of 'Execution of Louis XVI,' 'Battle of the Nile,' 'Union of Great Britain and Ireland,' 'Battle of Trafalgar,' 'The Walcheren Expedition,' and 'Assassination of Perceval.'

13. (*Men only.*) Prove the rule for finding the number of permutations of n different things taken r at a time.

(*Women only.*) As in First Year.

14. (*Men only.*) Three numbers are in A.P. The product of the extremes is five times the mean, and the sum of the two largest is three times the least. Find the numbers. Ans. $6\frac{1}{2}$, $5\frac{1}{2}$, 4.

(*Women only.*) Give directions for the cutting-out of a boy's shirt, observing the due proportions, and economising the materials.

15. Find the radius of a cone whose volume is 4,000 c. ins. and height 60 ins. Ans. 7·979 ins.

(*Women only.*) As in First Year.

16. (*Men only.*) The faces of a pyramid on a square base are equilateral triangles, a side of the base is 120 feet. Find the volume. Ans. $407293\frac{1}{2}$ c. ins.

(*Women only.*) As in First Year.

17. (*Men only.*) To divide a given straight line into two parts, so that the rectangle contained by the whole and one of the parts, may be equal to the square of the other part.

Show how to produce a straight line, so that the rectangle contained by the given line, and the line made up of the given line and part produced may be equal to the square of the part produced.

(*Women only.*) Point out some of the common faults of waste and ignorance in English cookery.

18. (*Men only.*) In any acute angled triangle the squares of the sides containing the acute angle are together greater than the square of the side subtending the acute angle by twice the rectangle contained by one of the sides, and the straight line intercepted between the acute angle and the perpendicular let fall upon it from the opposite angle.

The straight line PQ is divided in R, so that the rectangle PQ.QR is equal to the square of PR. Circles with centres Q, R, and radii equal to PR intersect in S. Show that PQS is an isosceles triangle, having each of the angles PQS, PSQ, double of QPS.

(*Women only.*) Give receipts for varieties of milk puddings, with accurate directions as to the proper modes of preparation. What precautions are necessary in the care of milk?

The names of all Certificate Candidates, not being students in any Training College, must be notified to the Department before the 1st of October.

All Students should procure Hughes' Certificate Copy Book. No other exactly reproduces the Departmental style and requirements.

CORRESPONDENCE.

We shall be pleased to reply briefly and through these columns to anyone seeking examinational information and advice.

This privilege does not, of course, extend to furnishing the solutions and answers of problems.

Replies demanding urgency will be promptly forwarded per post on receipt of a stamped and addressed envelope. A post will be saved by writing direct to DR. GEORGE BEACH, M.A. *(Examination Editor of Practical Teacher)*, STANLEY MOUNT, MACCLESFIELD.

M. W. (Bangor).—The Civil Service is just as glutted with candidates as the Teaching Profession.

J. L. M. (Oswestry).—Read and recite at the annual Inspection.

A. P. Z. (Walsall).—A pass in model (on paper) counts towards Scholarship results.

P. T. (Dublin).—There are 1s. and 6d. editions of all Scott's novels.

U. W. B. (Scarborough).—The two Benevolent agencies are not hostile to one another. Our lamented friend, Mr. Grove, was a strong supporter of both.

S. W. (Runcorn).—See answer to J. L. M.

J. L. (Waterhouses).—Report the matter to the Inspector and the Education Department.

U. N. (Edgbaston).—The College of Preceptors' Examination for the Teacher's Diploma qualifies you as an Assistant under Art. 51.

Y. Y. (Arbroath), J. D. S. (Southesk).—There is no thoroughly good book, but Pearce and Hague's History, published by Murby, has a number of good lives at the end.

S. B. (St. Leonards-on-Sea).—(1) Dunstan's Manual of Music. (2) Gregory's Physical and Astronomical Geography.

H. O. W. (Sowerby Bridge).—(1) You will be allowed. (2) From Eyre and Spottiswoode—through any scholastic stationer—price, 6d. each year.

'M' (Dundee).—Le Directoire, Pitt Press Series, 2s.

IGNORAMUS (Dudley).—Consult an encylopædia. It is utterly beyond the limits of our space.

J. B. THROSTLE (Westbromwich).—The bye-laws are distinctly against you.

OWN (Salisbury).—The Geography and History are useless. Get Brook's and Saunderson's.

W. A. (Wilnecote).—(1) Writing is poor. (2) Extras very good. (3) Yes, as nearly as is known, 75 per cent. (4) You should get a First.

SHORT (Pembroke Dock).—You must first serve a year in School.

T. T. (Ipswich).—Marks obtained this way at the Science or Art examinations will be in time to count.

D. D. F. (Oxford).—You can take Second Year Papers this Year.

TOZ (Bilston).—Howarth Barnes, 15, Wine Office Court, Fleet Street, London.

B. E. (Rochdale).—We do not undertake to furnish such information. Write to Manchester papers.

O. E. D. (Brigg).—Consult our advertisement columns.

P. R. (Stamford).—'La Jeune Sibérienne.'

JONES (Stoke).—See our present article.

G. G. E. (Chatham).—Gill's Second Grade.

A. W. (Eccles).—A Third Class in Scripture will certainly tell against your admission into a Diocesan College.

READING (Reading).—Scott's 'Fair Maid of Perth.'

R. T. (Builth).—You did not enclose stamp. See answers to SHORT and U. N. (Edgbaston).

JUSTICE (Longton).—A gross breach of faith, but nothing short of Parliamentary action would be effective.

C. F. (Birmingham).—We have sent on your letter.

BROOKS (Coventry).—The cost would vary from £20 to £40.

FRANK (Nottingham).—Apply to South Kensington, stating particulars, and you will receive it.

D. D. (Aston).—Questions are commenced in this month's issue. The Scholarship Course began in August.

TEB (Northampton).—Write to South Kensington, giving them the full particulars of your passes, and asking for your full Certificate. You will get it.

EXPERIENCED (Wolverhampton).—H.M. Inspector has a right to see each class at its usual work.

U. P. (Cardiff).—Join the N. U. T., and then report the next instance of oppression to the executive. One-man-management is doomed.

D. B. (Paisley).—Your Drawing Certificates will count.

M. F. (Skipton).—See Article.

SPARKBROOK (——).—We will shortly republish a list of the Euclid symbols and contractions that are allowed.

JULIUS (Salford).—He will have to take Third Year papers again.

S.P.Q.R. (Canterbury).—Roman History.

WREKIN (Dawley).—(1) Yes, advanced stage. (2) Dr. Tanner's 'Agriculture.' (3) Yes, but the course would be suicidal.

ANSWERED BY ORDINARY LETTER.

F. E. S. (Stemness, Orkney), G. E. H. (Plasmarl), J. N. (Langley), USE (Tynemouth), A. C. (Accrington), T. H. L. (Walsall), TONY (Sheffield), G. S. W. (Great Ressington), W. J. (Lentz Green), TOWN (Birkenhead), F. J. (Swansea), J. L. (King's Lynn), D. D. (Pontypridd), JONAS (Carlisle), W. S. (Congleton), E. B. (Cauldon Lowe), S. T. O. (Suckley), W. A. (Bromsgrove), METRIC (Welshpool), G. E. C. (Bury St. Edmunds), JAN. (Yarmouth), M. S. C. (Malton), O. C. (Oulsham), J. H. (Aston), D. L. (Ulverston), A. W. (Stourbridge), L. H. (Narberth), H. N. (Warrington), T. B. (Carmarthen), F. W. D. (Stamshaw), F. E. R. (Middleton), VINEY (Ayr), G. F. A. (Lavender Hill), E. S. (Ecclefechan), D. L. J. (Aberdare), G. W. (Newcastle), E. J. G. (Saundersfoot), E. A. A. (Holmforth), TRESKERBY (Exeter), J. I. (Plymouth), T. U. B. (Lincoln), W. E. J. (Kidsgrove), M. C. (Bedford Street), TEB (Northampton), E. C. (Oreston), E. B. (Halmersend), E. E. (Lower Clapton), W. H. P. (Southsea), J. H. J. (Aberdeen), E. B. (Newcastle-under-Lyme), J. H. (Chertsey), S. S. (Stockport). J. N. (Romford), A. F. (Whitehaven), Two Letters, C. J. (Windermere), D. M. G. (Carnoustie), L. U. (Ripon), 'S' (Nechells), A. S. (Tranmere), H.R. (Dartford), Z. I. (Shrewsbury).

SCIENCE NOTES.

ASTRONOMY AT CAMBRIDGE.—The death of the late Professor Adams is one of the most noteworthy events of the vacation at Cambridge. His career was a very distinguished one, his work as a young man at the University being brilliant, and winning for him the high position of Senior Wrangler of his year. Like many of our greatest mathematicians he soon left the pure study for its applications, and the masterly researches which led to his discovery of the planet Neptune soon marked him out as one of the coming men in Astronomical Science. He became Director of the Cambridge Observatory shortly after his appointment to the Lowndesian Professorship of Astronomy, and during his tenure of that office he initiated and carried out a series of computations of the highest value.

The necessity of the appointment of a successor has opened a very large question. Some of the candidates for the vacant chair have not by any means the same powers as the late Professor, and suggestions have been made, presumably in the interests of some of these, that it is undesirable any longer to unite the direction of the Observatory to the ordinary duties of a University Professor. Naturally these suggestions have given rise to a somewhat vigorous controversy, the astronomers pointing out that they would lead to a state of things that would be paralleled by the physical laboratory being taken out of the charge of the Professor of Physics, or by the Professor of Chemistry being debarred from exercising control over the Chemical Laboratory. There is in some quarters in Cambridge an idea that the Astronomical Professorships, and, indeed, others established in other subjects, are intended rather as rewards or pensions for distinguished men of science than as posts established for educational purposes, the acceptance of which should carry with it the duty of leading and training the younger minds of the University. It would be particularly deplorable just now for this divorce to take place, when we consider the impetus just given to astronomical research by the foundation of three valuable studentships at Cambridge, two of which have already been awarded to capable men. Also, we remember the munificent gift to the University by the late Mr. Newall of such a telescope as puts into the hands of observers those powers and opportunities which hitherto they have lacked.

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THE ARROW POISONS OF SAVAGE LIFE.—The various noxious matters with which different savage nations dress the points of their arrows received a good deal of attention in connection with Mr. H. M. Stanley's recent explorations in Africa. Surgeon Parke brought home several samples, which were examined with care by Mr. Holmes, of the Pharmaceutical Society, and were found to be vegetable in origin. The poison which is used by the natives of the New Hebrides differs from this in some important respects. It has been ascertained by M. Ledantec, working in the Pasteur Institute, that the deadly matter of which it is composed is partly at least bacterial in nature. Wounds from the poisoned arrows of the natives of the New Hebrides give rise to tetanus, and M. Ledantec has established that when the poison is scraped off the arrows and injected under the skin of a guinea pig the animal by-and-by dies of this disease. When the poison is examined by the methods in use in bacteriological work, it is found to contain the tetanus bacillus in abundance. The natives obtain the poison from the mud found in a particular swamp, and this mud also has been discovered to abound in the same micro-organism.

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THE LATE PRINCE LOUIS LUCIEN BONAPARTE.—It may not be generally known that the late prince was a man of considerable scientific eminence. His work, exalted as it was, may have tended to divert attention from the qualities which he possessed, which would have rendered him distinguished apart from it. In his early time he gave himself heartily to research in chemistry, and so successful was he in that field that by his discoveries he won admission to the ranks of the Legion of Honour. His most noteworthy paper was an account of a method of separating the two rare metals—cerium and didymium. The rarer metals as a group seemed to have a fascination for him, and he got together a most valuable collection of them. At his death he left this collection to the nation, and it will be arranged immediately at the Science Museum, South Kensington.

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EXTENSION OF UNIVERSITY COLLEGE.—While the controversy is pending as to whether University and King's Colleges shall serve as the nucleus of a new teaching university for London, it is interesting to notice that the former foundation has decided to enter at once upon a considerable extension of its buildings. The departments which are to be the subjects of this extension are those of physics, and of mechanical and electrical engineering. The erection will take place on the west side of the square in which the college stands, and will extend along the Gower Street front. The buildings will include laboratories and lecture rooms for the engineering school, and will be well fitted up with every necessary appliance. The removal of the engineering school to the new block will put at the disposal of the department of physics the basement and ground floor of the central wing of the main building.

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FLORA OF THE RED SEA COAST.—The labours of Dr. G. Schweinfurth on this subject are about to undergo a further development. He proposes now to explore the flora of Yemen and Northern Abyssinia, and for this purpose has taken up his residence in the Italian Colony on the Red Sea. Dr. Riva, of Bologna, accompanies him. Botanists will look forward with much interest to the publication of his researches, which will probably throw light on many of the problems of geographical distribution.

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NEW EPIDEMIC IN VIENNA.—Disquieting reports are reaching us from Vienna of the outbreak of a new disorder there, which some believe to be a new manifestation of the influenza in a different form. Instead of affecting the respiratory organs, it attacks the intestinal tract, giving rise to acute colic with ejection of blood, a good deal of fever being a further symptom. In medical circles opinions differ very widely as to its relation to influenza, some maintaining that there is a connection between them, while others suspect a contagion through the drinking water. Analysis of the latter, however, shows it to be of normal purity.

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NEW DEVELOPMENT IN ELECTRICAL SCIENCE.—Mr. Edison is understood to have been at work upon and to have brought nearly to practical issue a mode of telegraphy without the aid of metallic conductors. He holds that with his new apparatus the medium surrounding his batteries will be sufficient for the transmission and collection of the current. The main difficulties he has to contend with are those connected with the curvature of the earth. He considers that when he has completed his apparatus, ships will be able to communicate with each other through a distance of thirty miles, the water of the sea being the path of the current. Transmission through the air will, he thinks, be possible, but peculiar arrangements must be made to overcome the influence of the earth's curvature.

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THE FORMATION OF CHLOROPHYLL.—A series of experiments recently made by Herr Palladin on the etiolated leaves of wheat and field beans confirms Böhm's conclusions as to the favourable influence of calcium salts on the growth of etiolated leaves. While in leaves detached from the petiole and laid in diffused sunlight on a 10 per cent. solution of cane sugar, growth was inconsiderable, —though all the leaves became green after two days—in a mixed solution of calcium nitrate, and sugar, the normal colour was attained in twenty-four hours, vigorous growth ensued, and the leaves were still healthy after three days. Dr. Palladin argues, from the constant presence of iron in the ash of etiolated leaves of *Vicia Faba*, that no chlorophyll can be formed by the action of light in the absence of iron; but he is of opinion that iron alone is not capable of producing the green colour, for etiolated leaves laid upon solutions of different iron salts of various concentrations remained yellow even when exposed to light. He also maintains that chlorophyll cannot be formed in the absence of sugar.

***

AN EASY TEST FOR ARSENICAL WALL-PAPER.—Any one who suspects the presence of arsenic in his wall-paper can put the accuracy of his suspicion to the test in the following simple manner: Dip a small piece of the paper in strong ammonia water. If arsenic is present a bluish colour will appear. In order to make certainty doubly sure, a crystal of nitrate of silver can be moistened with a drop of this fluid. This further test will show whether the colour is due to arsenic, as, if it is, a deposit of yellow tint will be formed on the crystal.

***

THE DEVELOPMENT OF METEOROLOGY.—A very interesting survey of the present state of meteorological science has been furnished in his presidential address by M. Janssen, the new President of the French Meteorological Society. He points out also the direction in which further advance may be looked for, claiming, however, that the important services which it may render to mankind can only accrue when it is studied like other sciences for itself and not merely in its relationship to other subjects, such as agriculture. The methods of research which he lays stress upon include photography, and observations taken at

great altitudes, either by means of balloons or mountain stations. He also urges more extended use of self-registering instruments, which can work automatically for considerable periods, owing to the difficulty of carrying out prolonged observations at the highest stations.

***

GEOLOGY AT CAMBRIDGE.—The Cambridge University Press is just publishing a catalogue of the Type fossils in the Woodwardian Museum from the pen of Mr. Woods, of St. John's College. The Geology school has just suffered a severe loss by the death, from influenza, of Mr. T. Roberts, M.A., the assistant to Prof. McKenny Hughes, whose activity and zeal as a teacher have for some years been much appreciated.

J. R. G.

PRIZE ANECDOTE.

The following 'Anecdote' has been awarded the prize. A cheque for half-a-guinea has therefore been forwarded to the sender, Mr. W. J. DUNKIN, Head Master, Wesleyan School, Rawtenstall, Lancashire.

Writing on the blackboard these words—

'Boy, hook, fish,'

I desired the class to form a sentence therefrom. One lad wrote—

'The boy stole a fish and took his hook.'

We again offer a prize of half-a-guinea for the most *amusing* Anecdote connected with school life.

Competitors are requested to note—

(1) That they should write on *only one side* of the paper.

(2) That extracts from newspapers or books are excluded.

(3) That the judge reserves to himself the right to divide the prize between two or more competitors, and to print any anecdote submitted.

(4) That letters from parents, examination answers, indeed anything amusing connected with school life is admissable.

(5) That all anecdotes should reach the office not later than the 15th of March, and be addressed—

The Editor of
'THE PRACTICAL TEACHER,'
5, Pilgrim Street, Ludgate Hill,
London, E.C.

Anecdote.

ERROR PRIZE.

The error in answer to Sum 1, Card 13, of last month's Supplement was first pointed out by Mr. H. C. STEDDY, 6, Boxworth Grove, Barnsbury, N., to whom a cheque for half-a-guinea has been forwarded.

N.B.—No teacher can win more than one prize in six months.

☞ *We desire to call the special attention of our readers to the*

£1,000 FREE INSURANCE,

particulars of which will be found on page 3 of wrapper.—(ED. P. T.)

[Owing to the pressure on our space this month we regret we are compelled to hold over till next issue the following papers:—'Conversational Drawing Lessons for Infants,' 'Practical Needlework,' 'Tact in the Business of School-Keeping,' 'Model Answers to Questions set at the London Matriculation Examination,' 'Inspection of a London School,' 'Query Column,' 'Reviews,' etc.]

PRIZE ACTION SONG.

(ORIGINAL WORDS.)

The following has been adjudged the best Song in this competition. A cheque for One Guinea has therefore been sent to the author, Mr. ARTHUR J. BEAVIS, 28, Nelson Road, Ilkley.

'LITTLE SOLDIERS.'

Oh! would that we were soldiers
To fight on sea or land,
And keep all foes from England,
With teacher in command.

But, first, we'll stand 'attention,' (1)
Or rather, 'stand at ease,' (2)
Waiting our captain's orders,
To do whate'er he please.

Once more, we hear 'attention,' (3)
At once we all obey.
'Mark time!' (4) command is given,
We're ready for the fray.

'Halt!' (5) that command is given,
'Eyes right!' (6) the captain see,
'Right turn!' (7) we do it even;
'Quick march!' (8) we follow on.

The enemy are on us,
We see them closing in,
'Halt!' (9) 'left turn!' (10) our captain cries
The day we're sure to win.

'Present your arms,' (11) brave fellows,
Be ready for the fray,
The enemy are near us,
'Now, "Fire!" (12) without delay.'

'Hurrah! hurrah! (13) we've beat them,
They run! (14) they run! just see;
Yes, yes, we *will* have teacher
Our captain, brave, to be.'

(1) Children to stand with hands down by their sides and heels together.

(2) To stand at ease—right leg perfectly straight, with left leg bent, with heel of left foot to centre of right.

(3) Again as in (1).

(4) Mark time with both feet—left, right, left, right, and continue to beginning of next verse. (The music should go rather slower this verse.)

(5) All stop marking time, still keeping attention.

(6) Look straight before—at teacher.

(7) Children all turn to right.

(8) Rather than 'march,' children should mark time as (4), turned to right.

(9) All stop marking time.

(10) Turn into places again; attention as (1).

(11) Imitate placing guns to shoulder.

(12) Children clap their hands at 'Fire!'

(13) Wave their hands.

(14) Pointing as if enemy were running away.

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PROBLEMS.

STANDARD V

Presented with the MARCH Number of the 'PRACTICAL TEACHER,' Month

PROBLEMS.

STANDARD V.

Card 1.

1. Find the value by Practice of 3 cwt. of beef at 9¾d. per lb.
2. If 9 cows are worth 40 sheep, and 5 sheep are worth £12, how much are 6 cows worth?
3. A owns ¼ of a ship, and B $\frac{3}{10}$. Who has the larger share, and by how much?
4. Make a bill for: 360 penholders at 8 a penny; 750 envelopes at 10½d. per hundred; 5 reams of foolscap at 7d. per quire; ½ ream of note-paper at 5½d. per quire; 9 quires of blotting-paper at 16s. 8d. per ream.

Card 2.

1. What is the value of 56 cwt. 98 lbs. at £329 per ton?
2. A farmer exchanged 749 pigs, worth £3 16s. 9d. each, for 856 sheep, worth £2 18s. 3d. each. How much money did he receive in addition?
3. If 2 pints of milk cost 5½d., how much more ought 19 pints to cost than 5 pints?
4. Arrange in order, from the least to the greatest, $\frac{5}{9}$, $\frac{3}{5}$, $\frac{1}{6}$, $\frac{4}{7}$, $\frac{5}{8}$, and $\frac{3}{16}$.

Card 3.

1. Find the amount of a gentleman's income, if he pays £67 0s. 7½d. for income-tax at 11d. in the pound.
2. What is the value of 24,948 bottles of wine at 71s. 4d. per dozen?
3. Find the cost of 61 gals. 3 qts. 1 pt. of brandy at £61 8s. 6d. per hogshead of 63 gallons.
4. Bill: 9 lbs. moist sugar at 4s. 1d. per stone; 13 lbs. lump sugar at 5s. 3d. per stone; 6 lbs. soap at 2s. 11d. per stone; 8¼ lbs. cocoa at 1s. 2d. per lb.; 3¾ lbs. chocolate at 2s. 6d. per lb.

Card 4.

1. If a piece of cloth is 20 yards in length and ¾ quarters in breadth, how broad is another piece which is 12 yards long, and which contains as much cloth as the other?
2. What is the total value of 475 articles at ½d. each, 913 at ¾d. each, 162 at 1¼d. each, 3,807 at 3½d. each, and 5,946 at 5¾d. each?
3. What is the sum of the greatest and the least of the fractions $\frac{3}{4}$, $\frac{7}{9}$, $\frac{2}{3}$, $\frac{3}{5}$, and $\frac{7}{16}$?
4. How much must be given for 10 lbs. 7 oz. 3 drs. at £89 12s. per cwt.?

Card 5.

1. Find the total rent of 49 ac. 3 ro. 10 sq. po. at £2 5s. per acre; 156 ac. 2 ro. 32 sq. po. at £1 15s. per acre; and 263 ac. 24 sq. po. at £1 12s. 6d. per acre.
2. If after paying income-tax at 1s. 2d. in the pound a gentleman had £701 10s. 10d. remaining, what was his income?
3. One side of a square room is 57 feet long. How many square yards of carpet will cover it?
4. Find the value of 98 gals. 7 pts. at 7d. per quart.

Card 6.

1. Find the least number which can be divided exactly by 12, 18, 27, 36, 40, and 54.
2. What is the total value of 263 articles at £4 1s. 10½d. each, 589 at £7 13s. 6¾d. each, and 714 at £25 9s. 8½d. each?
3. Find the value by Practice of 7 acres at 7s. 9d. per sq. yard.
4. If half-a-dozen herrings are sold for 3½d., what should be charged for 27, and what for 99?

Card 7.

1. Find the value of a third part of an estate of 380 ac. 25 sq. po. at £136 4s. per acre.
2. If 7 men and 6 boys, each of the boys doing half as much as a man, can do a piece of work in 12 days, how long will it take 8 men and 14 boys?
3. Add $\frac{4}{11} - \frac{3}{16}$ to the difference between $\frac{5}{8}$ and unity.
4. Find the value of half-a-million articles at 12s. 8½d. per hundred.

Card 8.

1. A garrison of 930 men has provisions for 28 days. How long will the provisions last if 90 men are sent away?
2. Half of 19 bus. 2 pks. 1 gal. was sold at 35s. 4d. per bus., and the other half at 38s. 8d. per bus. How much was received altogether?
3. A fifth of an estate is worth £27,084 15s. What is the value of a seventh of the estate?
4. Make out the account for the following: 6 chests tea, each 2 qrs. 17 lbs., at 3s. 9d. per lb.; 13 hhds. brown sugar, each 13 cwt. 1 qr. 18 lbs., at 12s. 10d. per cwt.; 7 casks molasses, each 7 cwt. 2 qrs. 14 lbs., at 11s. 6d. per cwt.

Card 9.

1. A box of oranges was sold for 18s. 4½d. at 7d. per dozen. How many oranges did the box contain?
2. If a man has an income of £2 15s. 9d. daily, how much will he receive in the first three months of this year (1892)? (Work by Practice.)
3. What is the cost for 19 miles 1,235 yards at £25 13s. 4d. per mile?
4. Add $\frac{3}{8}$ of a £, $\frac{3}{8}$ of a shilling, $\frac{3}{8}$ of a florin, and $\frac{7}{16}$ of a crown.

Card 10.

1. A man's income is £460 a year, and he pays income-tax on it, except £150, at 5d. in the £. How much has he left?
2. A shopkeeper bought 3½ tons of sugar at £15 per ton, and sold it at 2 lbs. for 3½d. How much did he gain?
3. Take $\frac{3}{16}$ three times from twice $\frac{5}{11}$.
4. Bill: 55 eggs at 10 for 6d.; 42 eggs at 6 for 4½d.; 91 oranges at 7 for 5d.; 76 oranges at 2 for 1½d.; 39 lemons at 3 for 4d.

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Card 11.

1. What would it cost for coals in a factory if 456 tons 18 cwt. are used in the winter months, and 398 tons 16 cwt. in the summer months, the price being 11s. 8d. per ton?

2. If ½ of a field is sown with wheat, ¼ with barley, ⅛ with oats, and the remainder, 7 ac. 3 ro. 28 sq. po., is left for grass, what is the size of the field?

3. If 65 men can do a piece of work in 30 days, how many additional men are required to complete it 4 days earlier?

4. 75 men and a certain number of women earned £117 3s. in a week; each man earned 23s. 6d., and each woman earned 10s. 9d. How many women were there?

Card 12.

1. Find by Practice the value of 9,075 books at 4 for 3s. 5d.

2. What is the difference in rent between farms of 69 ac. 28 sq. po. and 34 ac. 2 ro. 13 sq. po. at £29 10s. per acre?

3. If a person pays £23 0s. 10d. income-tax at 7d. in the £, what is his income?

4. Which is the greater, ⅓ + ⅛ or ¼ + ⅙, and by how much?

Card 13.

1. A piece of beef weighing 19½ lbs. cost 16s. 3d.; what would it have cost if it had been 5¾ lbs. heavier?

2. ⅚ of £1 + ⅞ of 10s. − $\frac{9}{10}$ of half-a-crown.

3. A draper bought 318 yards of silk at 5s. 11d. a yard; he sold a third of it at 7s. 6d. a yard, and the remainder at 6s. 9d. a yard. How much did he gain?

4. What will be the amount for the following books:—13 reading books at 27s. per doz., 7 grammars at 18s. per doz., 22 geographies at 31s. 6d. per doz., 5 histories at 30s. per doz., 19 arithmetics at 15s. 6d. per doz.

Card 14.

1. If an apple was divided equally between three boys, and one boy gave away ⅛ of his share, what part had he left?

2. A garrison had provisions for 2,000 men for 156 days, but another thousand men came in; how long did the provisions last?

3. What is the difference in value between 17 tons 13 cwt. 26 lbs. and 8 tons 15 cwt. 3 qrs. at £16 6s. 8d. per ton?

4. A man bought 100 oranges at 4 a penny, and 300 at 3 a penny; he sold the lot at 8 for 3d. How much did he gain?

Card 15.

1. If 3 ponies are worth 8 sheep, and 12 sheep are worth £60, what is the value of a pony?

2. Can a father give ½ of his fortune to his first son, ⅖ to his second son, and ⅜ to his third son?

3. Add together 3,000 pounds, 3,000 half-crowns, 3,000 sixpences, and 3,000 farthings. Work this sum by Practice.

4. Twenty-five years ago a man was 4 times as old as his son, and his son's present age is 33 years. What is the father's present age?

Card 16.

1. Two men or 3 boys can finish a piece of work in 42 days; how long will it take 12 men and 3 boys to do it?

2. If ⅛ of the money in my purse is £7 10s., what is ⅓ of what I have got?

3. What is the value of 21 ac. 2 ro. 16¼ sq. po. at £2 3s. 4d. per rood?

4. Calculate the cost for the following:—60½ lbs. of tea at 2½d. per oz., 78 cwt. 97 lbs. of sugar at 9s. 4d. per qr., 24¾ cwt. of cocoa at 1s. 4d. per lb., 18 cwt. 2 qrs. 7 lbs. of rice at 2½d. per lb., 376¾ lbs. of coffee at 1s. 8d. per lb.

Card 17.

1. What will it cost for 16 months 2 weeks 5 days at 12s. 3d. per month of 4 weeks, and also for the same time at 6d. per day?

2. If it takes 20 horses 6 days to plough 249 acres, how long will it take them to plough 166 acres?

3. A boy had ⅜ of a cake, and he gave his two sisters ¼ each; what part had he left for himself?

4. Find the difference in value between 6 bus. 3 pks. 1 gal. and 29 bus. 2 pks. 1 gal. 2 qts. at 18s. 8d. per bushel.

Card 18.

1. If Tom walks 4½ miles, while Harry walks 3 miles, how far will Tom have to walk to overtake Harry when he has a start of 9 miles?

2. A person spent ½ of his holiday at the seaside, ⅓ in the country, and 5 days at home. What was the length of his holiday?

3. A bankrupt has £786 15s., and he can only pay 5s. 9d. in the pound; what do his creditors lose?

4. Work the following bill:—7 qts. of rum at 18s. per gal, 3 qts. of whisky at 23s. per gal., 5 qts. of brandy at 29s. per gal., 2 qts. of gin at 15s. per gal., 13 qts. of ale at 1s. 8d. per gal.

Card 19.

1. A gentleman's income is £570, and he pays income-tax at 5d. in the £ on his income. What is his net income?

2. How many hats at 5s. 3d. each should be given in exchange for two suits of clothes worth 3 guineas each?

3. A man spent ¾ of his money, and then gave away ⅓ of the remainder; he had £3 15s. left. How much had he at first?

4. If 137 qrs. 3 bus. 2 pks. of wheat are bought at 46s. per quarter and sold at 63s. 8d. per quarter, what is the gain?

PROBLEMS.

Card 1[illegible].

1. [illegible] what is the value of a [illegible]?

2. [illegible]

3. [illegible]

4. [illegible]

Card 1[illegible].

1. [illegible]

2. [illegible]

3. [illegible]

4. [illegible]

Card [illegible].

1. [illegible]

2. [illegible]

3. [illegible]

4. [illegible]

Card [illegible].

1. [illegible]

2. [illegible]

3. [illegible]

4. [illegible]

Card [illegible].

1. [illegible]

2. [illegible]

3. [illegible]

4. [illegible]

Card 11.

1. What would it cost for coals in a factory if [illegible] cwt. are used in the winter months, and [illegible] cwt. in the summer months, the price being [illegible] per ton?

2. [illegible]

3. [illegible] men can do a piece of work in [illegible] days, how many additional men are required to complete it [illegible] days earlier?

4. [illegible] and a certain number of women earned [illegible] each man [illegible] and each woman [illegible]. How many women were there?

Card [illegible].

1. [illegible]

2. [illegible]

3. [illegible]

4. [illegible]

Card [illegible].

1. [illegible]

2. [illegible]

3. [illegible]

4. What will be the [illegible]

Card [illegible].

1. [illegible]

2. [illegible]

3. [illegible]

4. [illegible]

Card 20.

1. If a train runs at the rate of 45 miles an hour, how many yards will it go in 3½ minutes?

2. How many fields, 110 yards square, can be made from 10,000 acres?

3. If I pay ⅛ of my income for rent, and $\frac{1}{10}$ of it in taxes, and still have £96 17s. 6d. left, what is my income?

4. Find the value of 19 miles 76 chains 14 yards at 3s. 10d. per yard.

Card 21.

1. A bankrupt owes £720, and his assets are worth £384; how much can he pay in the pound?

2. If an Austrian florin is worth 1s. 10d., how many Austrian florins could you get for £17 12s.?

3. What is the value of 2 tons 7 cwt. 7 stones 12 lbs. at a guinea per cwt.?

4. A mechanic works 5¼ days a week; his weekly wages amount to £1 19s. 4½d., and he works 10 hours a day; how much does he earn in an hour?

Card 22.

1. After spending $\frac{5}{6}$ of my money I had £4 19s. 6d. left; how much had I at first?

2. A train travelling at the rate of 36 miles an hour starts at 8.35 a.m. and arrives at its destination at noon. Allowing 20 minutes for stoppages, what distance has it travelled?

3. What would 95 miles 6 fur. 7 chains 18 yards cost at £36 13s. 4d. per mile?

4. Make out an invoice for the following goods:—9 pieces of cloth, each 17 yards, at 4s. 7d. per yard; 5 pieces of cloth, each 23½ yards, at 5s. 9d. per yard; 7 pieces of cloth, each 19¼ yards, at 6s. 6d. per yard; 10 pieces of cloth, each 25¾ yards, at 7s. 3d. per yard; 6 pieces of cloth, each 34½ yards, at 8s. 11d. per yard.

Card 23.

1. A gentleman has an income of 500 guineas, and he wishes to save £150. How much may he spend in 219 days?

2. What will 379 articles cost, if two cost 19s. 7½d.? (Work by Practice.)

3. Find the greatest number that will divide 1,365 and 2,682, leaving remainders of 2 and 3 respectively?

4. What is gained by buying 38 tons 12 cwt. 1 qr. at £9 18s. 4d. per ton and selling it at 1½d. per lb.?

Card 24.

1. How much must be added to $(\frac{1}{4} + \frac{3}{8})$ to make $(\frac{7}{8} + \frac{1}{2})$?

2. If 15 men earn £67 10s. in a fortnight, how much would 48 boys earn in the same time, when a boy's wages are a third of a man's?

3. What is the value of 76,890 cwt. at £17 13s. 8½d. per ton?

4. How many lbs. of tea at 1s. 10d. and 2s. 8d. per lb., an equal number of each kind, can be bought for £6 15s.?

Card 25.

1. A field will graze 22 cows for 48 days; how long will it last if 10 more cows are placed in the field?

2. 6 cwt. 1 qr. 13½ lbs. + 25 cwt. 3 qrs. 27⅝ lbs. + 18 cwt. 2 qrs. 9⅜ lbs. + 67 cwt. 3 qrs. 20¼ lbs. + 9 cwt. 16⅝ lbs.

3. What is the value of 27 sacks of flour, each weighing 19 stones 12 lbs., at 1s. 5½d. per stone?

4. Make out a bill for the following:—517 articles at £1 18s. each; 2,466 articles at 16s. per dozen; 3,019 articles at 15s. each; 620 dozen articles at £2 4s. per score.

Card 26.

1. Find the greatest number which will divide 54,693 and fifty thousand five hundred and four exactly.

2. Divide £51 18s. 1½d. among 70 boys and 92 girls, giving a boy three times as much as a girl; what is each share?

3. What will 15 packets of paper, each containing 29 reams 17 quires 20 sheets, cost at 12s. 6d. a ream?

4. A bankrupt paid £2,284 4s. 9½d., being at the rate of 12s. 10½d. in the £. How much did he owe?

Card 27.

1. What must be given for 558,576 lead pencils at 3s. 10½d. per gross?

2. If a man had $\frac{7}{12}$ of an acre, and he sold $\frac{3}{11}$ of an acre to one person and $\frac{1}{10}$ of an acre to another person, how much had he left?

3. After paying a rate of 9d. in the £, a gentleman had £731 10s. remaining; how much had he at first?

4. A lady paid with three ten-pound notes for the following articles:—64 yards of sheeting at 14½d. per yard; 4 pairs of blankets at 13s. 4d. per pair; 3 pairs of blankets at 12s. per pair; 18½ yards of silk at 5s. 6d. per yard; 26 yards of huckaback at 10¾d. per yard; 9 damask table-cloths, 4 of them at 19s. 6d. each, and the remainder at £1 6s. 6d. each; 4 balls of string at 1s. 6d. for a dozen balls. What change did she receive, the tradesman allowing half-a-guinea discount for cash?

Card 28.

1. A shopkeeper bought 37 bus. 3 pks. 1 gal. at 9s. per bushel; ⅛ of it was bad, and he sold the remainder at 10s. per bushel. How much did he lose?

2. Find the difference between the sum and difference of $\frac{3}{5}$ and $\frac{1}{3}$.

3. What sum will be raised by a rate of 3½d. in the £ on a parish whose total rental is £7,963 10s.? (Work by Practice.)

4. If a tree 7 ft. 6 in. long casts a shadow 9 ft. 6 in. long, how high is a tower which at the same time of the day casts a shadow 114 ft. long?

A Prize of **HALF-A-GUINEA** will be paid to the Teacher o is th

LONDON: JOSEPH HUGHES & Co., GRIM

Card 29.

1. What is three-tenths of ninety-five pounds sixteen shillings and fivepence halfpenny?
2. What shall I have left out of £400 after paying for 49 qrs. 27 lbs. 13 oz. 9 drs. at £7 9s. 4d. per quarter?
3. A quantity of provisions will last a garrison of 1,640 men for 15 days; how many men must be sent away, so that the provisions will last 24 days?
4. A luggage train consists of 62 wagons. The weight of an empty wagon is 5 tons 7 cwt. 9 lbs., and of a loaded wagon 13 tons; what is the total weight of the goods?

Card 30.

1. Find the cost of three miles of fencing at 1s. 10d. per yard, and 7d. per yard for labour.
2. Arrange in order of value :—$\frac{2}{3}$, $\frac{5}{6}$, $\frac{7}{8}$, and $\frac{9}{10}$.
3. What is the value of 173 gals. 1 qt. of wine at £28 17s. 6d. per hogshead of 63 gallons? (Work by Practice.)
4. If one can travel 176 miles for £2 18s. 8d., what will it cost to travel 65 miles farther?

ANSWERS.

Card 1.

1. £13 13s.
2. £64.
3. B by $\frac{1}{10}$.
4. 3s. 9d. + 6s. 6¾d. + £2 18s. 4d. + 4s. 7d. + 7s. 6d. = £4 0s. 8¾d.

Card 2.

1. £935 11s. 10½d.
2. £2,874 5s. 9d. — £2,493 2s. = £381 3s. 9d.
3. 3s. 2½d.
4. $\frac{1}{6}$, $\frac{1}{10}$, $\frac{1}{4}$, $\frac{2}{5}$, $\frac{1}{2}$, $\frac{3}{5}$.

Card 3.

1. £1,462 10s.
2. £7,415 2s.
3. £60 6s. 6¾d.
4. 2s. 7½d. + 4s. 10½d. + 1s. 3d. + 9s. 7½d. + 9s. 4½d. = £1 7s. 9d.

Card 4.

1. 1¼ yards.
2. 19s. 9½d. + £2 17s. 0¾d. + 16s. 10½d. + £55 10s. 4½d. + £142 9s. 1½d. = £202 13s. 2¾d.
3. $1\frac{1}{2}\frac{7}{8}$.
4. £8 7s. 2½d.

Card 5.

1. £112 1s. 6¾d. + £274 4s. 6d. + £427 12s. 4½d. = £813 18s. 5¼d.
2. £745.
3. 361 sq. yds.
4. £11 10s. 8½d.

Card 6.

1. 1,080.
2. £1,076 13s. 1½d. + £4,522 8s. 3¾d. + £18,196 11s. 9d. = £23,795 13 2¼d.
3. £13,128 10s.
4. 1s. 3¾d.; 4s. 9¾d.

Card 7.

1. £17,259 1s. 10½d.
2. 8 days.
3. $\frac{1}{4}\frac{2}{8}$.
4. £3,177 1s. 8d.

Card 8.

1. 31 days.
2. £36 6s. 1½d.
3. £19,346 5s.
4. £82 2s. 6d. + £111 17s. 4¼d. + £30 13s. 9¾d. = £224 13s. 8d.

Card 9.

1. 378 oranges.
2. £253 13s. 3d.
3. £505 13s. 6½d.
4. 13s. 6½d.

Card 10.

1. £453 10s. 10d.
2. £4 13s. 4d.
3. $\frac{1}{10}$.
4. 2s. 9d. + 2s. 7½d. + 5s. 5d. + 4s. 9d. + 4s. 4d. = 19s. 10½d.

Card 11.

1. £499 3s. 2d.
2. 95 ac. 16 sq. po.
3. 10 men.
4. 54 women.

Card 12.

1. £387 11s. 6¾d.
2. £2,040 13s. 3d. — £1,020 2s. 11¼d. = £1,020 10s. 3¾d.
3. £790.
4. $\frac{1}{3}$ + $\frac{1}{4}$ by $\frac{7}{10}$.

Card 13.

1. £1 1s. 0½d.
2. £1 3s. 2d.
3. £111 6s. — £94 1s. 6d. = £17 4s. 6d.
4. £1 9s. 3d. + 10s. 6d. + £2 17s. 9d. + 12s. 6d. + £1 4s. 6½d. = £6 14s. 6½d.

Card 14.

1. $\frac{7}{24}$.
2. 104 days.
3. £144 18s. 10½d.
4. 2s. 1d.

Card 15.

1. £13 6s. 8d.
2. No; not by $\frac{1}{10}$.
3. £3,453 2s. 6d.
4. 57 years.

Card 16.

1. 6 days.
2. £20.
3. £187 4s. 3½d.
4. £10 1s. 8d. + £147 4s. 4d. + £184 16s. + £21 13s. 1½d. + £31 7s. 11d. = £395 3s. 0½d.

Card 17.

1. £10 4s. 3¾d. + £11 13s. 6d. = £21 17s. 9¾d.
2. 4 days.
3. $\frac{1}{37}$ of the cake.
4. £21 5s. 10d.

Card 18.

1. 27 miles.
2. 30 days.
3. £560 11s. 2¼d.
4. £1 11s. 6d. + 17s. 3d. + £1 16s. 3d. + 7s. 6d. + 5s. 5d. = £4 17s. 11d.

Card 19.

1. £558 2s. 6d.
2. 24 hats.
3. £30.
4. £121 8s. 0¾d.

Card 20.

1. 4,620 yards.
2. 4,000 fields.
3. £125.
4. £6,732 9s. 8d.

Card 21.

1. 10s. 8d.
2. 192 Austrian florins.
3. £50 7s. 7½d.
4. 9d.

Card 22.

1. £29 17s.
2. 111 miles.
3. £3,514 8s. 4d.
4. £35 1s. 3d. + £33 15s. 7½d. + 43 15s. 10½d. + £93 6s. 10½d. + £92 5s. 9d. = £298 5s. 4½d.

Card 23.

1. £225.
2. £185 18s. 11¼d.
3. 47.
4. £540 11s. 6d. — £382 18s. 1¾d. = £157 13s. 4¼d.

Card 24.

1. $\frac{3}{4}$.
2. £72.
3. £67,991 11s. 8½d.
4. 30 lbs. of each kind.

Card 25.

1. 33 days.
2. 128 cwt. $3\frac{3}{8}$ lbs.
3. £39 1s. 10½d.
4. £982 6s. + £164 8s. + £2,264 5s. + £818 8s. = £4,229 7s.

Card 26.

1. 59.
2. Boy, 10s. 3¾d.; girl, 3s. 5¼d.
3. £280 4s. 8¼d.
4. £3,548 6s. 8d.

Card 27.

1. £751 11s. 1½d.
2. $\frac{1}{8}\frac{3}{8}$ of an acre.
3. £760.
4. £3 17s. 4d. + £2 13s. 4d. + £1 16s. + £5 1s. 9d. + £1 3s. 3½d. + £10 10s. 6d. + 6d. = £25 2s. 8½d. Change = £5 7s. 9½d.

Card 28.

1. £2 16 9¾d.
2. $\frac{3}{5}$.
3. £116 2s. 8¼d.
4. 30 yards.

Card 29.

1. £28 14s. 11½d.
2. £400 — £373 5s. 10¼d. = £26 14s. 1¾d.
3. 615 men.
4. 474 tons 1 cwt. 2 lbs.

Card 30.

1. £638.
2. $\frac{9}{10}$, $\frac{7}{8}$, $\frac{5}{6}$, $\frac{2}{3}$.
3. £79 8s. 1½d.
4. £4 0s. 4d.

N.B.—No teacher can win more than one prize in six months.

...cher... is the FIRST to point out an Error in the above Answers.

...RIM STREET, LUDGATE HILL, E.C.